

**ELECTRO DYNAMIC,
FACTORY IN RUINS,
PUSHES COME-BACK**

Phoenix, the mythical bird with miraculous powers of rejuvenation, symbolizes the massive effort being made by Electro Dynamic Division to rebound from the fire which destroyed its Bayonne, N. J., plant last month.

Fire hit the plant shortly after 2 p.m. April 20. Propelled by gusts up to 40 knots, it swept through the eight major and five smaller buildings. Five hours later, when the blaze was declared under control, the only equipment that had not been destroyed or severely damaged consisted of a truck and a station wagon. Fortunately, all employees in the plant at the time had been evacuated. No one was injured.

The oldest of General Dynamics' operating units, Electro Dynamic has been manufacturing electric motors and generator sets for more than 80 years, first in Philadelphia and since 1905 in Bayonne. Over the years, it has developed a reputation for high quality design and production, especially in the field of vibration-free and low-noise level motors for defense and industry. Electro Dynamic products are used extensively on nuclear submarines because they minimize the possibility of detection. They also provide high precision performance for manufacturers in the machine tool, elevator, air conditioning, automotive and other industries.

Even while the ruins were smoldering, division management began planning "Operation Phoenix." According to an Egyptian fable, the Phoenix was a singular bird which lived for 500 years, was consumed by fire, and rose with renewed youth from its own ashes.

Sunday morning following the fire all department heads gathered at the home of Raymond B. Carey Jr., division president. Roger Lewis, General Dynamics president, had assured him of complete assistance from the Corporation. Every other division either wired or telephoned with offers of equipment, personnel and facilities. Assistance was also

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DISCOUNT COUPONS—Jim Mallory, Dept. 17, picks up Six Flags coupons from Mickey Costello at GD/FWRA in-plant office. May 25 and 26 are "GD/FWRA Days."

**'Six Flags' Admission Rates
Cut 10 Pct. for GD/FW Folk**

Employees and their families will be entitled to discount admission rates to Six Flags during "GD/FWRA Days" May 25 and 26.

With special coupons, adults will be admitted for \$3.15, children under 12 for \$2.25. Children under 3 are admitted free.

Coupons are now available at the GD/FWRA in-plant office at the 50-foot aisle. They may be obtained only before and after work hours, and during lunch and rest periods.

The special rates represent a flat 10 per cent discount from (Continued on Page 6)

**Scott Triumphs in Election,
Takes Mgt. Club Reins in July**

M. J. Scott is newly elected president of General Dynamics/Fort Worth Management Club for 1963-64. Voting was by secret ballot Tuesday, May 7.

Scott, administrator of conservation, suggestions and materials handling in industrial engineering department, will succeed Miles Rogers, whose term expires in July.

Other newly elected officers are: B. J. Moore, vice president,

days; A. R. Carson, vice president, nights; I. E. Garrett, treasurer; E. M. Kerlee, corresponding secretary; and D. E. Wall, recording secretary.

Five members of the board of directors elected to serve a two-year term are: E. L. Clerc, J. E. Matthews, W. H. Vinson, L. E. Maxwell, and R. L. Sullivan.

A club member for more than 20 years, Scott is known as "Mr. Junior Achievement" among club members and is presently vice president—facilities, for Junior Achievement of Tarrant County. Scott was a recent general chairman of Fix-a-Toy.

Installation will be held at the July meeting.



M. J. Scott

**General Electric Gets
F-111 Subsystem Work**

Orders for approximately \$14 million in subsystems for Air Force/Navy F-111 supersonic tactical fighter planes have been announced by General Electric Co.

Three contracts — for attack radars, for flight control systems, and for portions of the armament system — were awarded by GD/Fort Worth, prime contractor for the revolutionary fighter.

GE said that the radar will be supplied by the company's Utica, N. Y., plant. The flight control systems and armament systems work will be done at its Johnson City, N. Y., plant.

The radar contract involves more than \$8½ million, the flight controls approximately \$4 million, and the armament system work about \$1.4 million.

The flight control system will help give the pilot positive control of the unique variable sweep wing craft throughout its wide performance range — from slow loitering cruise to speeds in the neighborhood of two and one-half times the speed of sound.

The armament work will include development of an optical sight and missile launch comput-

er for delivery of the bi-service aircraft weapons, which may be either nuclear or conventional.

The radar will include latest techniques to increase its range and to improve its "picture quality" as compared to present-day radars of this type.

The F-111, as an advanced high and low speed, high and low altitude performer, will be able to carry out a wide variety of Air Force and Navy missions that now require numerous different combat-type aircraft. The F-111, among other things, is designed to operate both from Navy aircraft carrier decks, and from primitive—short and rough—Air Force airstrips.

**WESTINGHOUSE
GETS CONTRACT**

The Aerospace Electrical Division of Westinghouse Electric Corp. at Lima, Ohio, will design and build electric-powered generating systems for the Air Force-Navy F-111 aircraft, it was announced recently.

Westinghouse will provide the primary alternating-current power-generating subsystem. This will consist of the generator con-

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**Professor to Speak
On Common Market
At Student Center**

The second of three lectures by TCU professors for Management Club members will be held from 7:30 to 9 p.m. tonight in Room 203 of the Brown-Lupton Student Center on the campus.

Prof. Floyd Durham will discuss "The Common Market—How It Affects You."

Cost of the series, which began May 8 and was scheduled for three consecutive Wednesdays, is \$4 for members, \$1 for wives.

Those wishing to attend are urged to submit registration blank and check to Harlow Cather, liberal arts committee chairman, Tube 034.

**City Mgr. to Speak
At Club 'Civic Night'**

Management Club members will get a chance to meet city leaders at "Civic Night" together tomorrow at Ridglea Country Club.

Social hour opens at 5:30 p.m., with dinner at 6:30 p.m.

Principal speakers will be Jerry Brownlee, city manager, and Bayard Friedman, new mayor.

Material departments, under direction of Clyde Ford, are sponsoring.

**'We Can Produce
The Best Plane'**

Roger Lewis, president of General Dynamics Corporation, appeared before the McClellan Committee in Washington, D. C., last week and presented Dynamics' side of the TFX controversy. Following are excerpts of his remarks:

"We at General Dynamics understand the vital interest of this committee both in the proper expenditure of public funds and in the most effective possible defense of this nation. I assure you that we share the same interest.

"The question of capability — that is, the capability to develop for, and deliver to, the using services an aircraft that meets their highest require-



Roger Lewis

ments, within an effective time span, and at a reasonable cost — may best be put in perspective in terms of the history of this company."

(At this point he reviewed the history of General Dynamics divisions.)

"Much more to the point, however, has been the history of the past decade, since General Dynamics itself came into existence.

"Within that short time span, General Dynamics developed and produced not one but five major weapon systems—simultaneously. These combined programs—Atlas intercontinental ballistic missiles, nuclear submarines and nuclear ballistic missile submarines, B-58 bombers, F-102 and F-106 aircraft, Terrier and Tartar air-defense missile systems—represent a major cornerstone of this country's total defense system.

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**Parking Areas Zoned in Move
To Reduce Traffic Congestion**

Changes in parking zones and certain traffic patterns went into effect last week.

The changes were announced by President Frank W. Davis in conjunction with recent creation of an additional work shift to relieve traffic congestion.

Effective May 6, a left turn off Clifford Ave. at Grants Lane could no longer be made from 6 to 8 a.m., and several non-reserved parking lanes in division parking lots were zoned to provide equivalent parking areas for each shift.

The White Settlement overpass route was to be used for entrance to the plant through the main gate by Clifford St. motorists between 6 and 8 a.m. In addition, traffic from Highway 183 (River Oaks) was required to form a single lane when entering Grants Lane leading to the plant.

"White Settlement and Fort Worth, the Texas Highway Department and GD/Fort Worth have coordinated in making the above changes in the interest of road safety and to improve the flow of traffic entering the plant," Davis said.

"You are also requested to observe the 30 mph speed limit now in effect in the road construction area adjacent to Ridgmar. Numerous traffic tickets have been written for violating

this speed limit."

In keeping with the recent shift change, parking in the zoned lanes, by each shift, is as follows:

7 a.m. shift—park only in 7 a.m. zoned lanes.

7:45 a.m. shift—park only in 7 and 7:45 a.m. zoned lanes.

8 a.m. shift—park only in 7, 7:45 and 8 a.m. zoned lanes.

3:45 p.m. shift—park in any zoned lane.

12:15 a.m. shift—park in any zoned lanes other than the 7 a.m. lanes.

Markers will be placed to indicate the proper parking lanes for various shifts.

"Please observe the above and park only in the indicated lanes for your shift," Davis said. "If these lanes are filled you must then park in the unzoned lanes. Your cooperation is requested in honoring the zoned parking lanes."

Starting last week, all departments (other than engineering) which formerly reported to work at 8 a.m., were changed to a new 7:45 to 4:30 p.m. shift. Some 2,200 people were affected by the change.

The over 2,700 employees in engineering departments remain on the 8 a.m.-to-4:45 p.m. shift.

At the same time, a new lunch period schedule went into effect.

**Nicholson and Hay Named
April 'Suggesters of Month'**

J. G. Nicholson, 10-2, and R. H. Hay, 75, have been named "Suggesters of the Month" for April.

Nicholson's Cost Improvement



J. G. Nicholson



R. H. Hay

Proposal resulted in installed savings of \$666, while Hay's leading

Employee Suggestion saved \$3,221 and earned him \$322 in award money.

Installed for only \$11, Nicholson's CIP called for setting up source data for cost and profit summary reports on a specially prepared keysort type card for each contract included in the report.

Previously, this data was entered on worksheets. But a request for data summary by customer and type of effort made it necessary to set up an additional set of worksheets.

The new method eliminated usage of worksheets and resulted in several intangible benefits, such as: more timely reporting, historical data for continuing analysis, and a ready means for (Continued on Page 6)

New Concept For Atlas Seen In NASA Study

Atlas, once dubbed the "work-horse of the space age," may well turn out to be just that if a current plan within the National Aeronautics and Space Administration (NASA) materializes.

This concept would have Atlas and an Agena stage powering aloft "supply trains" for a proposed orbiting research laboratory.

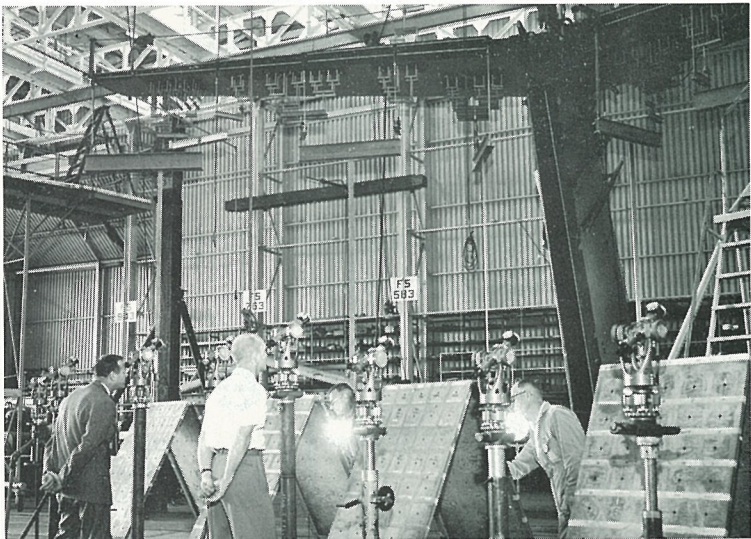
Aerospace industry proposals for studying manned orbital research laboratory systems capable of sustaining a four-man crew in space for one year were to have been submitted to NASA's Langley Research Center yesterday (May 14).

NASA's concept is to have a laboratory launched by a Saturn vehicle into a circular orbit. After a checkout, two crew members using a Gemini spacecraft would be launched to complete a rendezvous and docking maneuver with the laboratory. Later, two more crewmen would join the laboratory by the same method. At intervals of 90 days or less, unmanned resupply spacecraft would be launched by Atlas-Agena combinations and brought by radio control to a rendezvous.

Reasoning is that such a laboratory would provide the means of conducting scientific and engineering research impossible to duplicate on earth. Effects of space environment and weightlessness would be studied.

Two contracts are expected to evolve from requested proposals.

Phase I will provide a comparative study of several alternate ways to obtain the orbital laboratory envisioned. Following evaluation, NASA could follow with Phase II design study.



TALL TAIL—In lower shot, first C-141 empennage is mated to fuselage at Lockheed-Georgia Co.'s Marietta factory. Aft fuselage had to be lowered and front tilted to permit high tail section to be placed on top inside building. At top, John Gillette and Don Bowers of GD/Convair structures lab sight through transits at mirrors mounted on C-141 horizontal stabilizer while F. O. Peterson and M. G. Henderson, both Dept. 131, mark points on graph boards during stiffness tests.

Mirrors Accomplish C-141 Stabilizer Test

Tricks by mirrors measured stiffness of C-141 stabilizers in recent structural testing at the GD/Convair ramp laboratory.

During loading, from 3,000 to 28,000 pounds per side, structures test engineers recorded angular changes due to torsion by sighting through a row of transits at nine mirrors mounted along the edge of vertical and horizontal stabilizers. Mirrors reflect cross-hair images back to scale graph boards to indicate deflection changes.

In this way torsional and bending stiffness can be calculated to confirm design requirements, explained John Gillette and W. D. Bowers, test engineers in charge of the test project.

This was the first time the mirror method had been used in structural testing at GD/Convair structures lab, they said. It was particularly applicable to these specific tests to gather criteria which is vitally important because of the pivotal function of the C-141 horizontal stabilizer.

In other related tests, the pivotal joint was subjected to yaw and roll stiffness testing. Also, the fin was laid horizontally and hung with dial gauges on a steel space frame in another test technique for measuring bending and torque.

Test results will go to Lockheed-Georgia Co., prime contractor on the Air Force jet cargo transport, for evaluation.

Lockheed Praises Static Empennage

A message to President J. H. Farnham of GD/Convair from Lee Poore, Lockheed-Georgia Co. assistant director — manufacturing operations, lauded C-141 production performance upon mating of the first delivered empennage to the fuselage:

"My congratulations to you and your folks. The static empennage was successfully installed April 22 without any problems. Thanks for a good job!"

General Dynamics Plants Close May 30

General Dynamics people in all divisions will have a one-day holiday the last of this month as they observe Memorial Day on Thursday (May 30).

Plants will be closed with the exception of necessary maintenance and security personnel. All shifts will report at usual work hours the following day, Friday.

'We Can Produce The Best Plane'

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No other company in the world can match that record.

"Every one of these represented, through their development and production, enormous advances in technology over anything previously considered within the state of the art. In many aspects they continue to represent unmatched technology.

"The advanced technological and scientific capability that made this sweep possible is still intact. We are quite accustomed to taking quantum, rather than merely incremental, steps. We are accustomed to the unique problems associated with the development of a superior weapon system, in the shortest time period and at minimum cost.

"Grumman Aviation Engineering Corporation has had at least as distinguished a record in its production for the Navy's air requirements. Since 1930, Grumman has produced over 25,000 aircraft of which 23,500 were carrier-based fighter or attack aircraft...

"I believe there can be no question about the capability of the General Dynamics/Grumman team with its associated major subcontractors, to deliver to the using services an aircraft that will meet their highest requirements, immediately and for the decades following.

"The program for the development and testing of the TFX was established in its present form by the military services after long and careful analysis. Twenty-three aircraft are what the Air Force and the Navy decided they needed to test and develop the design.

"This program, as established, formed the basis around which a long and hard competition was held, one that saw continuing process of design refinement. We have to assume this method of competition was selected from alternatives as being the best suited to achieve the objectives of this complex weapon system.

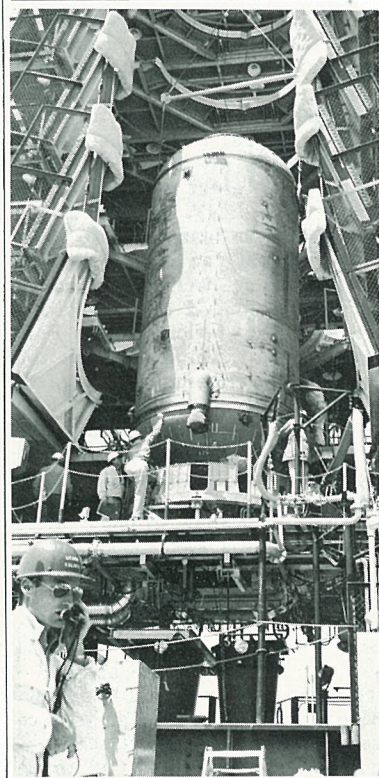
"We won that competition, and have been contractually committed since December, 1962 under a fixed price incentive contract to design and develop the TFX within a very limited time and in accordance with very demanding specifications.

"As of this time we and our principal subcontractors have several thousand people hard at work in order to meet our contractual obligations. Important decisions with respect to design, tooling, and the like have been made. A number of major subcontracts have already been let; many others are in the final stages of selection. Special machinery is being ordered. Substantial progress has already been made in such critical areas as wind tunnel and component testing. We expect to start ground tests in months...

"While the ultimate decision is one for the Department of Defense to make, we believe that to interfere with the momentum of the existing program would be

wasteful of the work already accomplished, and would delay significantly the operational date for the TFX.

"I have complete confidence that we can and will deliver to the users a weapon system that will give the United States a tactical air capability second to none. I believe that the design we have chosen represents the best and most straight-forward approach to the TFX requirements and that it can be built for the least total program cost..."



SNUG FIT—GD/Astro crews at Edwards RS gently swing new Centaur battleship propulsion test vehicle tank into place on Stand 1-1. Note mattresses placed as fenders to guard against scratching. Talker in foreground is Paul Witten.

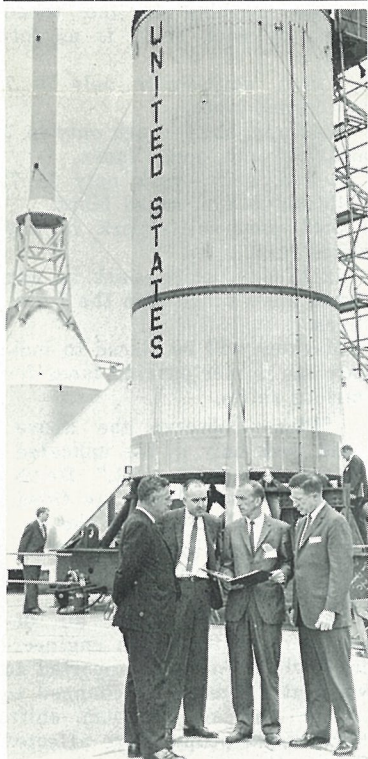
'BPTV' Readied For Hot Firing

EDWARDS RS—A BPTV on TS 1-1 here at ERS is being readied "PDQ" by GD/A crews.

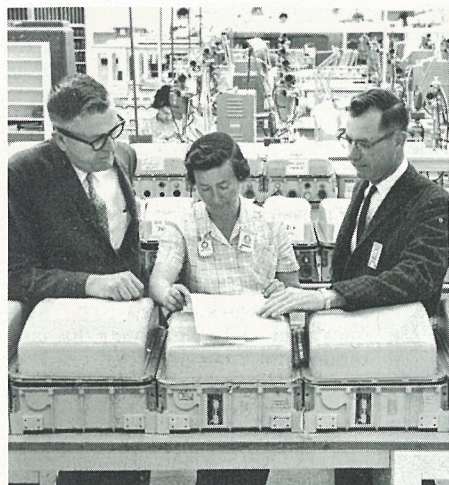
If you missed a point, General Dynamics/Astronautics crews here at Edwards Rocket Site (ERS) are working swiftly (PDQ) in installation buildup of a battleship propulsion test vehicle (BPTV) mounted on Test Stand 1-1 (TS 1-1).

First of its kind, the BPTV represents the efforts of many groups and is destined to serve the Centaur test program.

It was designed and fabricated at the main plant. Tooling turned out the basic components. Major assembly handled welding. Inspection ran exacting X-ray checks on all seams. Checkout ran the unit through a series of steps, including the hydrostatic test tower. It was then cleaned and trucked here over a roundabout route, due to excessive height.



NASA INSPECTION—From left, Walter C. Williams, NASA Manned Spacecraft Center, Houston, Texas, deputy director for mission requirements; Robert O. Piland, MSC manager of Apollo Project office; J. B. Hurt, GD/Convair program manager of Little Joe II; and James C. Elms, MSC deputy director for development and programs, look over first launch vehicle during two-day visit of NASA officials at GD/Convair.



METICULOUS CARE—By taking extraordinary pains, GD/Astro's electronic manufacturing has established near-perfect record. At left is general view of area and leaning against completed autopilot assemblies are R. H. Sparks, general supervisor, Milly Carson, inspector, J. Fred Baebler, chief of inspection (factory). In next

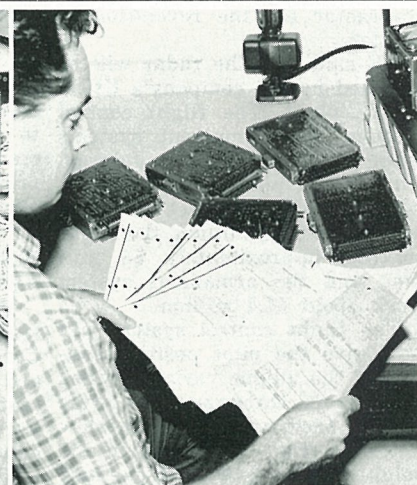
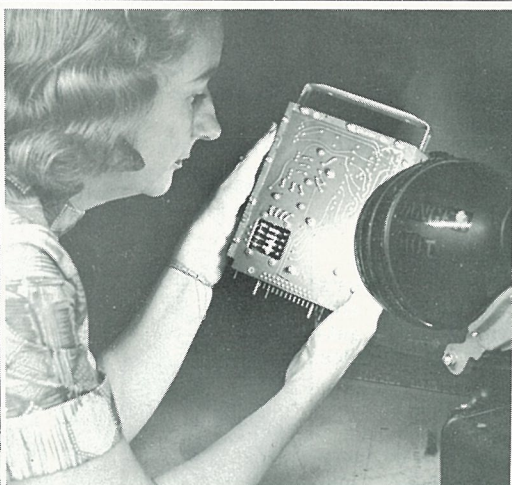


photo Mary May holds module under ultra violet light, typical of efforts to detect flaws. Second from right, Dorothy Smith checks details under magnification. At right, J. L. Cardwell, inspector, disassembled autopilot in background, fans out part of paperwork involved in check.



CARRY ON!—When fire destroyed Bayonne, N.J., plant of Electro Dynamic Division of General Dynamics, personnel moved into nearby quarters offered by Englander Co., mattress manufacturers. In lower left photo, Walter A. LaPierre, manager of research and development, (right), confers with staff. At lower right, Sam

De Nisi of sales telephones customer, assuring that commitments will be met. In lower center, Nick Kaminsky, engineering layout man, achieves degree of privacy by using bedsprings as partition! Water tower (top center), although still standing after fire, was damaged by searing flames.

F-102 FIS Nominated For 5th AF Award

An F-102 Air Force squadron, the 4th Fighter-Interceptor Squadron at Misawa, Japan, has been nominated by the Fifth Air Force for a performance award for the third quarter of fiscal year 1963.

This is the second successive nomination for the 4th FIS, and its third in a year, reports A. C. Shedrick, GD/Convair field service representative.

The 4th FIS was cited for special improvement in training accomplishments, for the high skill of its pilots, and for its outstanding safety records.

990 Sets Another Record For Speed

A Convair 990 set another speed record the latter part of April between San Diego and Chicago. The American Airlines' Astrojet sped cross-country in 2 hours, 41 minutes, 45 seconds, shaving seven minutes from the previous record.

Two General Dynamics men, H. P. Williams, GD/Convair manager of value control, and F. J. Traversi, GD/Astro vice president-administration, were aboard to testify to the speedy flight.

Electro Dynamic, Plant in Ruins, Shows Fighting, Come-Back Spirit

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offered by Bayonne civic officials and many other sources. At the Sunday morning meeting, task forces were formed to explore all possible means to get the division functioning as soon as possible. Later in the day, department heads met with staffs to give them specific missions.

At this point, "Operation Phoenix" had no headquarters, but Electro Dynamic's next-door neighbor, The Englander Co. gave the division a home.

A manufacturer of bedding equipment, Englander lost a warehouse in the fire but its main building was intact. A storage area was cleared for temporary offices, and additional space was obtained in downtown Bayonne.

"Englander has been wonderful to us," a division executive commented. "They gave us a big helping hand when we needed it most."

Leonard R. Allen, manufacturing services manager, set about equipping offices. Folding tables were converted to desks. Telephones were installed and a temporary switchboard was set up in time to receive calls at the opening of business on Monday. International Business Machines Corporation loaned typewriters

and dictating machines to supplement similar equipment from the Corporate office. Duplicating equipment was supplied by American Photocopy Co. Calculators were rented. The caterer who had run the division cafeteria made arrangements to feed employees with a mobile unit. Stationery and office supplies were purchased.

As early as possible on Monday, William D. McCarthy, plant superintendent and industrial relations manager, met with employees to fill them in on the situation and to tell them about measures being taken to assist them in the weeks ahead. McCarthy worked closely with officials of the union, Local 1035 of the United Automobile Workers, who had offered assistance immediately.

The major problem confronting the division was reconstructing records lost in the fire, especially those of the engineering and sales departments. Calls went out to customers and suppliers who cooperated by duplicating their records and sending copies.

Pattern makers who had bid on jobs over the last ten years sent in their copies of engineering drawings. Some 10,000 water-soaked drawings were eventually retrieved from the ruins and hung up around the office to dry.

New drawing boards and drafting equipment were delivered within two days.

Members of the sales force fanned out across the country or contacted customers by telephone to keep them advised of pro-

gress. Salesmen worked with customers to establish realistic priorities so that the most urgent orders could be filled readily when production could be resumed.

All possible methods of production, including sub-contracting of some work to other manufacturers, are being weighed.

The purchasing department canvassed suppliers to determine how quickly new equipment could be obtained once operational plans were firmed up.

The comptroller's department and insurance specialists in the Corporate office assembled comprehensive data needed to expedite insurance claims.

Although "Operation Phoenix" is a round-the-clock, all-hands evolution that continues through weekends, morale is high. Harris Shapiro, vice president-engineering, said, "I'm astonished at what has been accomplished. I've always taken pride in this operation but never like this. Our people have been fantastic."

A veteran draftsman, surveying the twisted confusion of steel girders and rubble that had been the plant said wistfully, "It's hard to believe — you look out the window and see that." But his mood was a transient one and in a matter of moments he was commenting in words that sum up the spirit behind "Operation Phoenix," "We'll make it."

President Carey emphasized that all commitments to customers would be met and that deliveries on orders open at the time of the fire would be made as quickly as possible.



COMPUTER GATHERING—John L. Lombardo, general manager of GD/Electronics-SD (far left), welcomes Robert E. Moore of Corporate staff, coordinator of GD Computer Panel meeting in San Diego. Others, from left, are A. E. Andress of GD/Astro; J. G. Lewis, GD/Pomona; R. G. Bond, GD/E-SD; L. H. Loehr, Stromberg-Carlson; T. S. Kennedy, Canadair Limited; K. A. Bridgeman, GD/E-Rochester.

Standard Computer Procedures Among Dynamics Divisions Goal

Standardization of all computer documentation within General Dynamics Corporation was approved unanimously by some 50 delegates from nine Corporate divisions at the General Dynamics Computer Panel last month.

Panel sessions were hosted by GD/Electronics - San Diego, with Thomas Kennedy of Canadair Limited as general chairman.

G. O. Withem of GD/Convair, member of the panel's outgoing executive committee, drew attention to the necessity for a satisfactory and workable computer documentation procedure for all General Dynamics divisions so that information can be interchangeable at all times.

In addition to manpower savings in reducing duplication of programming efforts, standard documentation would greatly ease the task of transmitting data on programs within the company, he explained.

Implementation of the adopted resolution will be the responsibility of the Corporate systems department under Robert E. Moore, GD manager of systems and procedures and data processing.

Other business saw the election of a new executive committee for a one-year term. Robert Carson and Robert McWhorter of GD/Fort Worth form the business and scientific team representing the Western divisions. Ralph Fragola and William Peirce of Electric Boat were chosen as the Eastern team.

They replace the first executive committee of Withem; Dov Abramis, GD/Pomona; Kennedy of Canadair; and A. J. Van Woerkom of Electric Boat.

Panel meetings to exchange information on computer operations and developments are held once each year with the next hosted by Electric Boat in Groton, Conn.

HELLER HONORED FOR VALUE PAPER

E. D. Heller, manager of value control at GD/Astronautics, was cited at the recent annual convention of the Society of American Value Engineers for contributing the outstanding article of the year on value engineering.

Heller received a special plaque for his paper, "Cost as a Design Parameter," published in the SAVE Journal for September, 1962.

Both Heller and M. L. Hicks, GD/Fort Worth vice president-legal and procurement, spoke during the two-day meet, April 25-26, in New York.

Other General Dynamics delegates included F. J. Traversi of GD/Astronautics; H. P. Williams, GD/Convair; C. W. Doyle and Rand Creasy, GD/Fort Worth; C. C. Frankenberger and E. H. Conklin, GD/Pomona; and K. Mikelson and R. F. Stapells of Canadair Limited.



E. D. Heller



"Your qualifications check out, but we'll have to have more information on this nickname of yours . . . 'Old Blabbermouth'!"



HAPPY WINNER—M. L. Maurer, outgoing GD/FWRA Garden Club president, shows off his artistic entry titled "Cartwheel," and Award of Distinction ribbon won at recent Spring Garden Club Show. Doris McKee, incoming president, holds first-place ribbon also won by Maurer.

French and Maurer Take Honors In Annual Spring Flower Show

The Annual GD/FWRA Spring Flower Show was held May 4 at the Botanic Garden Center, with judges awarding 36 blue ribbons in the artistic and horticulture divisions.

Mrs. Gladys Breckenridge was sweepstakes winner in the artistic division with the greatest number of blue ribbons.

Mrs. R. E. French, wife of R. E. French, Dept. 62, took first in Classes 3 and 4 and was winner of the tricolor ribbon. Matt Maurer, Dept. 3-5, won first place in Class 8 and was awarded the ribbon for the award of distinction.

Other winners in the artistic division were: Mrs. M. L. Maurer, Class 6, and Martha Hatcock, Class 10.

Mrs. Ruth Goulette, Dept. 260, won best of show in horticulture for her potted plant. Best cut specimen of show in horticulture belonged to R. E. French, Dept. 62.

Sweepstakes winners in horticulture division were Mikalee LeFevre, Dept. 260, (potted plants), and Mrs. C. I. McKee (cut specimens).

Receiving green rosettes for special awards were Mikalee LeFevre for show staging; Mrs. Dora Manning and Gladys Breckenridge for educational exhibits.

Show judges were Mmes. V. E. Hanby, Truett Edwards, Paul Nix, C. A. Minnis, E. N. Line, and Victor Tinsley.

Pruitt, Strobel Lead Chess Club

Newly elected officers of the GD/FWRA Chess Activity are Virgil Pruitt, Dept. 79, president, and Al Strobel, Dept. 62, secretary-treasurer.

Next regular meeting is scheduled at 7:30 p.m. June 5 in the GD/FWRA Council Room, according to Commissioner E. W. Gomez.

Mineral Society Elects Masseege

Bob Masseege, Dept. 28-6, was elected vice president of the Texas Federation of Mineral Societies, Inc., at its annual convention in Amarillo last week. Masseege was present as a delegate of the GD/FWRA Stone Steppers Club.

The Texas Federation has about 2,500 members and is one of six regional federations comprising the American Federation of Mineralogical Societies, which has a combined membership of more than 40,000.

Masseege is also a member of the board of directors of the AFMS and will represent that organization at their national convention in Oklahoma City, June 13 through 16.

Masseege has taught several beginners lapidary classes and has assisted Commissioner Bob Norment in several others. He is past president of the Stone Steppers Club.

GD/FWRA Fencers Host Division Finals

On April 27 the GD/FWRA Fencing Activity hosted the division finals in foil for the North Texas Division of the Amateur Fencing League of America.

Thirty fencers from all parts of North Texas converged at the GD/FWRA Fieldhouse to compete for division trophies and the privilege of representing the division at the sectional and national competitions.

The GD/FWRA fencers, Jim Orr, Dept. 162, Hugh Hodgins, Dept. 268, Louise Watson, wife of Galen Watson, Dept. 62, and Helen Bohn, daughter of J. G. Bohn, Dept. 81, topped a very successful first season by placing as follows: Orr, first alternate; Hodgins, second alternate (men's foil); Louise Watson, second alternate (women's foil).

The tournament was followed by a barbecue dinner in the Fieldhouse. Entertainment was provided by Mrs. E. Abbott of Waco and Miss Evelyn Guerrero, daughter of the Governor of Guam. Miss Guerrero is a law student at Baylor.

Bowling Season Approaches End

"The 1962-63 fall bowling season has reached a climax for many leagues and is fast approaching an end for others," said Commissioner Harry Carlberg.

In recent league news, the "Jim Dandies" took first in the Guys and Gals League. Team members were: Eddie Pair, Esco Huber, Jim and Pearl Brock.

In the B-58 League, a roll-off between "The Splitters," first-half winners, and the "Rolloes," second half winners, was won by "Rolloes." Team consisted of: Marvin Brooks, Pete Mills, Jack Kauffman, John Sharpe, Wesley Stephenson, and Melvin Scarr.

Saturday Set For Grapevine Cruise

Regular monthly meeting of GD/FWRA Boat Club is scheduled at 7:30 tonight in the Clubhouse.

An outing and cruise is planned at Lake Grapevine beginning at 10 a.m. Saturday.



DECISION—Frances Brooks, educational services secretary, studies list of trips and illustrations depicted on new GD/FWRA Travel Club folder. Frances has been thinking about the European Tour set for September.

Only Two Weeks Left to Sign For September Europe Tour

GD/FWRA folks have only two weeks left to make reservations for the European tour which is scheduled to leave Fort Worth Sept. 7 and return Sept. 28.

A minimum of 77 people are required to make the trip. Tour cost is \$385 a person. For those who would rather do as they please in Europe, air fare only is \$367.50.

Reservations must be made in the inplant recreation office by June 1.

The group is scheduled to leave New York, bound for Amsterdam, Sept. 8.

Other highlights of the tour will be trips to Brussels, Luxembourg, Heidelberg, Lucerne, Innsbruck, Venice, Florence, Rome, Nice, Paris, and London.

In London the visitors will see Buckingham Palace, Westminster Abbey, London Bridge, Tower of London, Piccadilly Circus, Hyde Park, and various other London sights, with one day off for shopping or touring on their own.

June and July trips planned by the GD/FWRA Travel Club include one by chartered bus June 14 to Ruidoso for the races, and a fishing trip to Freeport July 20. An around-the-world tour is planned from July 6 through July 28. Cost of the tour is \$1,594 with a minimum of 15 people required to make the trip. Scheduled stops are Copenhagen, Zurich, Lucerne, Cairo, Karachi, Delhi, Calcutta, Bangkok, Singa-

pore, Manila, Tokyo and Honolulu.

Other tours for this year include trips to the Canadian Rockies, Las Vegas and San Francisco, Hawaii, Mexico City and Acapulco, and the Caribbean.

Further information regarding any of the above trips may be obtained by contacting the GD/FWRA Plant Recreation Office on the 50-foot aisle.

Beginners Bridge Class Opens Soon

A beginners bridge class is scheduled to start at 6:30 p.m. May 17 at the Clubhouse, announced Commissioner Bill Culbertson.

Six weekly one-hour classes will be offered.

Fee is \$3 per person and may be paid at the inplant recreation office or at the Clubhouse opening night.

Winners in the recent GD/FWRA "PAR" bridge tournament were Mel Gans and Matt Rubenstein (east-west) and Henry Wetman and Andy D'Ascenzo (north-south).

Radio Club Calls Special Meeting

A special meeting of the GD/FWRA Radio Club is planned for 2 p.m. June 2 at the Clubhouse, for the purpose of electing new officers.

Activities Calendar . . .

General Dynamics/Fort Worth Recreation Association events in the next two weeks are listed below. Readers interested may clip this column and save it for reference until next issue of General Dynamics News. For more information, phone GD/FWRA office, ext. 2771.

Tonight, May 15	Tuesday, May 20
BASEBALL: minor league, 6:30 p.m. and 8 p.m., GD/FWRA.	FENCING: 7-10 p.m., GD/FWRA Fieldhouse.
BOAT CLUB: meeting, 7:30 p.m., GD/FWRA.	MODEL AIRPLANE: free-flight contest, 1 p.m., Benbrook Lake.
TABLE TENNIS: play, 6-11 p.m., GD/FWRA Fieldhouse.	TABLE TENNIS: play, 1:30 p.m., GD/FWRA Fieldhouse.
Thursday, May 16	Monday, May 20
ART: class, 7-10 p.m., GD/FWRA Council Room.	MOVIE: "George Washington Slept Here," with Jack Benny. Shown lunch period, 50-foot aisle.
RADIO: meeting, 7:30 p.m., GD/FWRA Radio Room.	Tuesday, May 21
SQUARE DANCING: classes: beginners, 7 p.m.; advanced, 8:15 p.m., GD/FWRA.	FENCING: 7-10 p.m., GD/FWRA Fieldhouse.
Friday, May 17	Wednesday, May 22
ART: class, 9:30 a.m., GD/FWRA Council Room.	BRIDGE: duplicate session, 9:30 a.m., GD/FWRA Clubhouse.
BRIDGE: beginner's class, 6:30 p.m.; play, 7:45 p.m., GD/FWRA Clubhouse.	TABLE TENNIS: play, 6-11 p.m., GD/FWRA Fieldhouse.
GUN CLUB: ham shoot, 9 a.m., FW Gun and Sleet Club.	Thursday, May 23
Sunday, May 19	ART: class, 7-10 p.m., GD/FWRA Council Room.
FENCING: 7-10 p.m., GD/FWRA Fieldhouse.	RADIO: meeting, 7:30 p.m., GD/FWRA Radio Room.
MODEL AIRPLANE: free-flight contest, 1 p.m., Benbrook Lake.	SQUARE DANCING: classes: beginners, 7 p.m.; advanced, 8:15 p.m., GD/FWRA.
TABLE TENNIS: play, 1:30 p.m., GD/FWRA Fieldhouse.	Friday, May 24
Monday, May 20	ART: class, 9:30 a.m., GD/FWRA Council Room.
MOVIE: "George Washington Slept Here," with Jack Benny. Shown lunch period, 50-foot aisle.	BRIDGE: duplicate session, 9:30 a.m., GD/FWRA Clubhouse.
Tuesday, May 21	Saturday, May 25
FENCING: 7-10 p.m., GD/FWRA Fieldhouse.	GUN CLUB: ham shoot, 9 a.m., FW Gun and Sleet Club.
Wednesday, May 22	Sunday, May 26
BRIDGE: duplicate session, 9:30 a.m., GD/FWRA Clubhouse.	FENCING: 7-10 p.m., GD/FWRA Fieldhouse.
TABLE TENNIS: play, 1:30 p.m., GD/FWRA Fieldhouse.	Monday, May 27
MOVIE: "Juarez," with Paul Muni and Bette Davis. Shown lunch period, 50-foot aisle.	MOVIE: "Juarez," with Paul Muni and Bette Davis. Shown lunch period, 50-foot aisle.
Tuesday, May 28	Tuesday, May 28
COIN CLUB: meeting, 8 p.m., GD/FWRA.	FENCING: 7-10 p.m., GD/FWRA Fieldhouse.
GARDEN CLUB: meeting, 7:45 p.m., Botanic Garden Center.	Wednesday, May 29
BRIDGE: duplicate session, 9:30 a.m., GD/FWRA Clubhouse.	

Log Book Entries

Promotions

Promotions to and within supervision, professional and administrative effective April 22:

Dept. 19-4: to electronic data processing programmer, G. B. Head; Dept. 24-8: to tool engineer senior, C. G. Harper.

Dept. 27: to inspection supervisor, O. T. Harrell, C. F. Holder; to non-destructive inspection specialist, P. S. Newsom.

Dept. 28: to process analyst, G. F. Ferguson; Dept. 63: to design specialist, C. E. Kuchar.

Dept. 107-2: to chief of manufacturing liaison, L. O. Odom; Dept. 106: to engineering drawings checker, K. Lane; to group engineer, L. C. McWhorter; to project a e r o s y s t e m s engineer, J. D. Bedunah.

Dept. 181: to departmental assistant, B. J. Ferris; Dept. 206: to engineering planner, T. G. Sanderson Jr.; to engineering publications editor, R. W. Underwood, E. A. Williams; to engineering writer, B. V. Casler, A. J. Fairweather, F. W. Hackney, R. D. Honea, H. L. West.

Dept. 307: to development liaison man, J. L. Battistoni, D. E. Sessions.

Awards

The following received Employee Suggestion awards totaling \$200.80 for the period ending April 30:

Dept. 30, L. E. Bowlen, J. R. Fritts, H. McMurtre; Dept. 63-0, B. Miracle; Dept. 268-5, W. D. Choate.

Retirements

HAMPTON—H. D., Dept. 14-1. Seniority date Dec. 14, 1948 (FW), retirement effective May 17, 8820 Rockway, Fort Worth, Texas.

KINZER—R. C., Dept. 53. Seniority date Dec. 17, 1942 (FW), retirement effective April 30, 4013 W. Fifth, Fort Worth, Texas.

MECUM—W. W., Dept. 23-1. Seniority date Feb. 3, 1955 (FW), retirement effective April 23, 2245 Fairmount, Fort Worth, Texas.

MEGLASSON—R. M., Dept. 32. Seniority date June 30, 1948 (FW), retirement effective April 22, 1311 Hymond, Stephenville, Texas.

RANGEL—E., Dept. 57. Seniority date Feb. 19, 1947 (FW), retirement effective Feb. 11, 3615 N. Clinton Ave., Fort Worth 6, Texas.

General Dynamics NEWS

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'We Can Produce The Best Plane'

(Following is the text of a statement by Roger Lewis, president of General Dynamics Corporation, to the permanent subcommittee on Government Operations, U.S. Senate, made last week in Washington, D.C.)

"Mr. Chairman:

"My name is Roger Lewis. I am President and Chief Executive Officer of General Dynamics Corporation. I was elected to that post in February, 1962, some time after the initiation of the competition which led to the award of the RDT&E letter contract for the F-111 in November 1962.

"I have been associated directly with the aircraft industry for almost 30 years, starting at Lockheed Aircraft Corp. in 1934. Since then I have been active in many phases of production, material control, purchasing, sales and management on programs representing both military and civil aviation.

"To answer your questions in the technical area, Mr. Frank Davis, president of our Fort Worth Division, where the F-111 is currently under active development, is also here.

"Mr. Davis, a former Marine Corps pilot, has been part of the aircraft production operations of this company for 23 years. In 1945, as chief of aerodynamics and flight test at what was then known as Vultee Field Division of Convair, he was the first pilot to fly a turboprop powered aircraft, the experimental XP-81 fighter. In 1947 he was named chief design engineer at Convair's San Diego Division, where he was closely identified with the development of the XF-92A, the world's first delta wing aircraft, and the AF F-102 supersonic interceptor, among other projects. Since 1954, Mr. Davis has been with our Fort Worth Division, first as chief engineer and since 1959 as manager and president of that division. During this period, Mr. Davis has been a key figure in the design, development and production of the AF B-58 bomber, which is still the free-world's only supersonic, four-engine bomber.

"As an accommodation to the committee, I am pleased to be able to say that Messrs. E. Clinton Towl, George Titterton, and Corwin Meyer of the Grumman Aircraft Engineering Corporation are present.

"Grumman Aircraft is our chief subcontractor on the F-111, and our proposal was developed in conjunction with that company. Grumman Aircraft, as you gentlemen are aware, is not only a leading company in meeting U.S. Navy air requirements, particularly for carrier-based planes, but has also built and flown the only variable sweep wing aircraft designed for operational use.

"Mr. Towl, president and chief executive of Grumman since 1960, was one of its founders in 1930. Mr. Titterton, senior vice president in charge of program development, has been with Grumman since 1936, and in the aviation industry since 1926. During World War II, he was chief of production and engineering for that company, and has since directed manufacturing and production of all Grumman's major programs. Mr. Meyer, with Grumman since 1942, is currently director of aircraft development. He was chief test pilot during flight test of the XF-10-F variable sweep wing aircraft in 1952-53. During the year-long testing that successfully demonstrated variable sweep wing technology, Mr. Meyer piloted the plane on 232 flights.

"I appreciate the opportunity the committee has given me to be here today. We at General Dynamics understand the vital interest of this committee both in the proper expenditure of public funds and in the most effective possible defense of this nation. I assure you that we share that interest.

"As you may imagine, I have followed the published testimony over the previous two months of hearings with great interest.

Based on this published material, it seems to me that the emphasis of the testimony has been largely in the areas of capability, cost, and competition. I believe clarification of some of the implications of previous testimony might be useful to this committee.

"The question of capability—that is, the capability to develop for, and deliver to, the using services an aircraft that meets their highest requirements, within an effective time span, and at a reasonable cost—may best be put in perspective in terms of the history of this company.

"General Dynamics is made up of 11 operating divisions in the United States and one major Canadian subsidiary. Of the 11 U.S. divisions, six operate largely in what is generally considered the 'defense' area.

"General Dynamics Corporation came into being under that name only in 1952. However, some of its key components go back more than 60 years.

"One component, Electric Boat Division, the direct predecessor of General Dynamics, delivered to the U.S. Navy its first submarine in 1900. During World War I, Electric Boat supervised the construction of, and delivered to the Navy, 173 submarines. During World War II, we delivered 97 submarines and 399 patrol torpedo boats. Since then we have built the world's first nuclear submarine, and have been the lead yard and prototype builder for most of the Navy's nuclear undersea fleet.

"Another early component, Consolidated Vultee Corporation, became the Convair Division of General Dynamics, and has since grown into four autonomous divisions: Astronautics, Convair, Fort Worth, and Pomona. This component has been producing aircraft, military and commercial, since 1908, beginning originally as the Gallaudet Aircraft Corporation. Convair, in the 30 years between 1923 and 1953, when it became part of General Dynamics, produced no less than 42 different models of aircraft for the Army, the Navy, the Air Force, and commercial carrier lines. These have included sea planes, patrol planes, bombers, pursuit, attack and interceptor aircraft, as well as commercial transports. During World War II, Convair delivered more than 350 million pounds of airframe, approximately 13 per cent of the total national output, or a total of more than 33,000 military aircraft, plus the equivalent of 5,000 more in spare parts. These included the PBV series of flying boats, B-24 Liberator bombers, C-87 Liberator express transport, Valiant trainers and Sentinel liaison planes.

"Much more to the point, however, has been the history of the past decade, since General Dynamics itself came into existence.

"Within that short time span, General Dynamics developed and produced not one but five major weapon systems—simultaneously. These combined programs—Atlas intercontinental ballistic missiles, nuclear submarines and nuclear ballistic missile submarines, B-58 bombers, F-102 and F-106 aircraft, Terrier and Tartar air-defense missile systems—represent a major cornerstone of this country's total defense system. No other company in the world can match that record.

"Today, the F-102 and the F-106 are the backbone of Air Defense Command. The Atlas was the first—and for a considerable time, the only—operational intercontinental missile available to back this country's deterrent stance. As a booster, it has launched all of this country's manned orbital space flights. The B-58 remains the Strategic Air Command's, and the free-world's

only supersonic bomber.

"General Dynamics' Electric Boat Division continues as the world's leading design yard for submarines, and has delivered some 40 per cent of our nuclear undersea fleet. Terrier and Tartar missiles represent important elements of the Navy's air defense.

"Every one of these represented, through their development and production, enormous advances in technology over anything previously considered within the state of the art. In many aspects they continue to represent unmatched technology.

"The advanced technological and scientific capability that made this sweep possible is still intact. We are quite accustomed to taking quantum, rather than merely incremental, steps. We are accustomed to the unique problems associated with the development of a superior weapon system, in the shortest time period and at minimum cost.

"Grumman Aviation Engineering Corporation has had at least as distinguished a record in its production for the Navy's air requirements. Since 1930, Grumman has produced over 25,000 aircraft of which 23,500 were carrier-based fighter or attack aircraft . . .

"Among a number of Grumman firsts for the Navy were: retractable landing gear, in 1931; the folding wing, in 1937; the swept-wing, in 1951; the area-rule fuselage, and the carrier-based supersonic F11-F-1 fighter in 1954, and the F11-F-1F carrier-based Mach 2 fighter-bomber in 1956.

"I believe there can be no question about the capability of the General Dynamics-Grumman team with its associated major subcontractors, to deliver to the using services an aircraft that will meet their highest requirements, immediately and for the decades following.

"As to the question of competition:

"Throughout our history we have considered ourselves as a weapon system developer, responsive to the requirements of the services. We have gone through periods of national emergency, when thousands of men worked around the clock; we have had lean years when it was a struggle to keep our capability together. Competition has been our way of life. Sometimes we have won, sometimes we have lost. When we have lost, even if we felt strongly that we had presented the better proposal, we analyzed our shortcomings and determined to be better prepared for the next competition.

"We believe in competition. You gentlemen will recall that the year-long competition leading to the award of this contract, first between six and later between two contractors, has been considered the most severe ever applied to any potential weapon system. It has not been easy for us, nor I suspect, for any of our rivals or for the evaluation teams of the services and the Department of Defense. Yet we have felt that this competition, in defining, and refining, the requirements of a weapon system to a more advanced point than had ever before been reached prior to an actual award, was in the best interest of the nation.

"We believe that, as a result of the long process of refinement, the Department of Defense objective of a common airplane for two services has been achieved. Both final proposals represented aircraft far better than could have been attained with less exhaustive procedures.

"This leads to the question of now re-opening the competition on the basis of in-flight comparison of two or four prototypes. Some weeks ago, Mr. Chairman, you advised us that our rival had offered such a proposal. You asked us to submit a parallel estimate of costs. We could only conclude from the request to both companies that the committee has in mind a new competition.

"We have been most anxious to cooperate with the subcommittee and its staff. From the very beginning of the inquiry some months ago, we have responded to all requests levied upon us. In

general, the information we were called upon to furnish consisted of available data bearing on the TFX competition. The information now requested would have to be developed.

"The program for the development and testing of the TFX was established in its present form by the military services after long and careful analysis. Twenty-three aircraft are what the Air Force and the Navy decided they needed to test and develop the design.

"This program, as established, formed the basis around which a long and hard competition was held, one that saw continuing process of design refinement. We have to assume this method of competition was selected from alternatives as being the best suited to achieve the objectives of this complex weapon system.

"We won that competition, and have been contractually committed since December, 1962 under a fixed price incentive contract to design and develop the TFX within a very limited time and in accordance with very demanding specifications.

"As of this time we and our principal subcontractors have several thousand people hard at work in order to meet our contractual obligations. Important decisions with respect to design, tooling, and the like have been made. A number of major subcontracts have already been let; many others are in the final stages of selection. Special machinery is being ordered. Substantial progress has already been made in such critical areas as wind tunnel and component testing. We expect to start ground tests in months . . .

"While the ultimate decision is one for the Department of Defense to make, we believe that to interfere with the momentum of the existing program would be wasteful of the work already accomplished, and would delay significantly the operational date for the TFX.

"If we have misunderstood the intent of the inquiry, and the committee desires only an order of magnitude figure as a basis of discussion, you already have such a submission. Its validity could be quite easily evaluated for the committee by appropriate independent technical experts.

"One final point—on the question of cost estimates:

"One witness before this committee recently provided a full summary of the cost estimating procedures which are essentially standard throughout the aerospace industry—although the nomenclature may vary somewhat from company to company. As you know, our costing procedures, which I assure you were thorough, have been documented at length to your staff by our representatives.

"However, because both General Dynamics and Grumman have recently built both super-

sonic and subsonic manned aircraft, we have been able to check and validate our estimates against actual program experience.

"General Dynamics has more experience than any other contractor in the production of supersonic aircraft, through the B-58, the F-102, and the F-106. Dynamics-built aircraft have already accumulated more than 50,000 hours of supersonic flight time. We additionally have extensive experience in the development and production of supersonic missiles, through our Terrier and Tartar program, and of hypersonic vehicles through our Atlas and Centaur programs.

"As our associate and major subcontractor, Grumman Aircraft Engineering Corp. adds a wealth of experience with naval weapon systems, such as the supersonic F11F fighter and the A2F all weather attack system.

"Our combined cost proposals were based on knowledge of the complexities of the supersonic flight for both bomber and fighter configurations, land-based and carrier-based, as well as of the problems inherent in the highly advanced technology called for in the F-111.

"There is sometimes a temptation in a hard-fought competition to shave the price on the research portion of a program, where the potential exists for sizable production orders later. We have not done this. Our price is a close one, but it includes a modest profit.

"This will be a fixed price incentive contract. If, as we hope, through careful management we can produce this airplane for even less than the amount we have contracted, the government will receive 90 per cent of such savings, and at the same time be protected against over-runs.

"Since the award of the contract last November we, our associate contractors and our subcontractors, have been working full time on the development of this aircraft. We have had full cooperation from all segments of government and industry involved in this project. The morale of all the people involved in this project is extremely high.

"I have complete confidence that we can and will deliver to the users a weapon system that will give the United States a tactical air capability second to none. I believe that the design we have chosen represents the best and most straight-forward approach to the TFX requirements and that it can be built for the least total program cost . . ."

"Some of the testimony before this committee has created erroneous impressions about our proposal. Certain of these points should be clarified and others brought out. Mr. Frank Davis, President of our Fort Worth Division, is responsible for the development of the F-111 and has a statement to make."

Dynamics' Design Advantages Given

(Following is the text of a statement by Frank W. Davis, president of General Dynamics/Fort Worth, to the permanent subcommittee on Government Operation, U.S. Senate, made last week in Washington, D.C. The word "deletion" has been used to indicate security excerpts.)

"Mr. Chairman:

"I am Frank W. Davis. I have been Manager of the Fort Worth Division of General Dynamics Corporation since 1959, and President since 1961. Prior to that I was Chief Engineer.

"I am a graduate of California Institute of Technology, and have been honored with a degree of Doctor of Science from West Virginia University for contributions in the field of aeronautics.

"I received my wings as a Naval aviator at the Naval Air Station in Pensacola, Florida, in 1937, and served in fighter and dive bomber squadrons of the U. S. Marine Corps.

"I joined one of the predecessor companies of General Dynamics in 1940 as Engineering Test Pilot. I have flown or flight-test-

ed some 75 different types and models of aircraft, including fighters, dive bombers and attack bombers.

"During my 23 years with General Dynamics I have had, at one time or another, engineering design responsibilities for fighters, missiles, bombers, seaplanes and commercial aircraft. I still fly as time and circumstances permit, and have flown a TB-58 at Mach 2 speed at altitude and at Mach (deletion) on the deck.

"My most recent and relevant experience for the TFX is in connection with the F-102 and the B-58, both supersonic manned aircraft; the first an all-weather fighter, the second a bomber.

"My design responsibilities have included many 'firsts.' At

(Continued on next page)

(Continued from page 1)
some stage in their development I have been in responsible charge of design and/or test of the following:

- first intercontinental ballistic missile,
- first turboprop fighter,
- first vertical take-off fighter,
- first delta-wing fighter,
- first supersonic bomber.

"For General Dynamics I am now charged with total responsibility for TFX.

"I do not hesitate in the least to tell you that the General Dynamics TFX is the superior weapon system, will cost less to produce in the planned quantities, and better meets the stated requirements of the Secretary of Defense for a bi-service aircraft. The testimony to date reflects that in the final evaluation, the Source Selection Board had before it weighted scores which in the aggregate favored General Dynamics by 8.2 points, adjusted down to .3 of a point. In my judgment, the General Dynamics TFX has a greater superiority than is reflected in these official scores in its favor.

"First, let's talk about the airplane itself.

BASIC DESIGN MISSION

"The basic USAF mission of the TFX is the Tactical Air Command (TAC) (deletion) mission. 6/7 of the airplanes are planned for this purpose. In this mission, the airplane takes off and flies (deletion) until it reaches the target and drops its bombs. It then (deletion) returns home. This is a contractual requirement and is identified in the statement of work as the 'Basic Design Mission.' This is the mission that was most difficult for the airplane designers to meet. The General Dynamics airplane, as evaluated by the Air Force, offers (deletion) more range than the Boeing airplane does, in this, the basic design mission.

"As shown in earlier testimony in terms of a few miles difference in dash, the true significance of this element of performance has been obscured. Here is why. The enemy's defense is assumed by the military to be so many miles deep. You need the (deletion) dash to get through. This is where you may get shot down. You would like to be able to operate from a base well back from the target. If you cannot because of lack of range on this mission, you will have to abandon the target, move closer to the target, or be prepared to accept more losses because of your vulnerability at lower speeds in the enemy's defended area.

"How much further away does the Air Force say the General Dynamics airplane may be based? (Deletion) further, a direct result of admitted superior (deletion) performance. Superior (deletion) design results in lower fuel consumption during the dash. The fuel saved is used to extend the (deletion) mission. This advantage becomes greater if the enemy decides to increase his depth of defense.

"If you utilize actual bases and actual targets in Europe or Asia to demonstrate the value of this additional range, the superiority of the General Dynamics TFX is clearly revealed. It covers 19% more targets in Europe and 14.5% more in Asia. This is a direct measure of wartime combat effectiveness. That is what you and I are paying for. Thus, the General Dynamics TFX gives you more combat effectiveness per dollar.

"This is the basic TAC mission; this is where the airplane and engines work hardest to succeed; this is where General Dynamics concentrated and was found superior; and this is the mission where the most growth potential is needed because it is the enemy who decides how deeply to defend his targets. If he increases his defense by 25%, the General Dynamics range advantage increases from (deletion).

"A basic principle of efficient supersonic aerodynamics is to have the smallest frontal area to minimize wave drag. From the testimony of the evaluation group, it was stated that the General

Dynamics design adhered best to this principle. The larger frontal area of the Boeing design would require basic and fundamental redesign to improve. Time and money are required to do this.

"This is the true significance of General Dynamics admitted superiority in the supersonic design of the TFX. This is the guts of the whole design problem for the Air Force airplane. This advantage has been obtained only by the most careful shaping of the fuselage and wing, and by carefully positioning the engine inlets for maximum efficiency.

FERRY RANGE

"The erroneous impression persists that in ferry range capability with external tanks the Boeing airplane exceeds that of General Dynamics by 1,100 miles. The record should be set straight here. Ferry range without external tanks is the only specific ferry range requirement in the work statement. General Dynamics meets the range requirement comfortably as evaluated. And as we predicted, ranges in excess of those shown on Exhibit 29 claimed by Boeing are now known to be attainable by our airplane.

"In the time honored manner you can hang additional external fuel tanks on the airplane until a reasonable maximum operational weight is reached. This maximum operational weight is reached long before the physical restraints are reached for installation of external tanks. In other words, the structural strength limits the weight that is carried and consequently the ferry range that can be achieved, not the number and size of tanks that can be physically accommodated. There is more than adequate room available on the General Dynamics F-111 wing to add (deletion) more hard points if desired. As brought out in previous testimony, General Dynamics provided strength in its structure and landing gear to take off with 10,000 pounds more weight than Boeing. When operating to the same structural margins of safety the General Dynamics airplane ferry range with external fuel will substantially exceed that of Boeing. Exhibit 29 should be corrected to reflect this fact.

"In addition, General Dynamics has designed into its airplane the capability of installing the (deletion) longer Navy wing tips on the Air Force airplane which will extend the ferry range by a substantial increment. As an additional bonus the sturdier Navy landing gear is interchangeable with that in the Air Force airplane and can provide added strength for unrestricted operation from rough fields at greater than normal weight.

"As we will discuss later under commonality, General Dynamics designed the basic structure of the wing and fuselage to be identical. The longer wing tips are bolted on the Navy airplane and a different nose is used. The Navy landing gear is stronger and heavier to take carrier landings but is interchangeable with the Air Force gear. The fuselage and attachments for either version of the General Dynamics airplane are strong enough for the greater loads occasioned by carrier landings.

BOMB LOADS

"Bomb load has likewise been portrayed as a significant issue; in reality, it is not. The requirement was for a certain number of external hard points for attaching bomb racks, and a certain bomb load. General Dynamics proposed a practical load well beyond the requirements and consonant with the landing gear strength capability for TFX type operation. You will recall that we provided strength in the Air Force structure and landing gear for 10,000 pounds more weight than did Boeing.

"In practice the machine would be loaded down with whatever external bomb load was desired for a particular situation so long as the strength of the airplane was not pushed too far. It was expected that an experienced technical evaluation team would find no cause to make an issue of the specific typical loadings shown in the proposal document, and indeed they did not.

"The simple fact is that either airplane can greatly exceed bomb load requirements. It is also reasonable to expect that the General Dynamics airplane could be pushed to greater overload because of the greater load carrying capability of the structure and the option exists of putting on the Navy landing gear at any time that it might be desired to further increase the strength for rough field operation at extremely high gross weights as previously mentioned.

"Significantly, Source Selection Board members in recent testimony confirmed that the ferry range figures with external fuel and the ordnance loads shown on the Committee Staff's chart (Exhibit 29) were not developed under similar ground rules and they stated that these items were not evaluated to determine ultimate capability. Since the chart has created the impression that the Boeing design was better, the record should be set straight by correcting Exhibit 29 to show that the General Dynamics TFX could carry 10,000 pounds more load than Boeing.

LANDING DISTANCE, THRUST REVERSERS

"Landing distance has also become an issue. The evaluation shows that either airplane meets the requirement with ample margin. The shorter roll reported for the Boeing airplane is based on the proposed use of a thrust reverser.

"General Dynamics likes the idea of thrust reversers for stopping on the ground—it uses them on its commercial airplanes for that purpose. But in the TFX this is not the whole problem. Satisfactory braking in the air for combat operations is also required. This complicates the thrust reverser development problem and makes them heavier. The thrust reversers for the TFX must be able to stand up in service and operate very reliably even though its parts must frequently withstand the severe vibration and 3,000° temperature of afterburner operation not required in transport applications. In addition, it must not warp or bend enough to allow even a small degradation in nozzle efficiency, for it is intimately associated with the already complex and sensitive nozzle system of the TF 30 engine. A 3% degradation in nozzle efficiency, altogether possible with a poor thrust reverser installation, would sacrifice 25% of the required (deletion) dash distance. I doubt that TAC would accept that.

"Mr. Jordan of Pratt & Whitney discussed the problems of developing a thrust reverser for the TF 30 engine at length. We have also discussed the problem with the Rohr Corporation, builders of thrust reversers. We do not believe a satisfactory thrust reverser will be developed in time to meet the needs of the early TFX airplanes.

"General Dynamics did not want to be caught off schedule on the important air braking requirement so it proposed the tried and true dive brake system and used wheel brakes—the simplest system for stopping on the ground. As evaluated, this provides a landing distance you can overshoot by 1/4 without exceeding the requirement. If and when a satisfactory thrust reverser is developed, and we are anxious to aid in such development, the General Dynamics engine installation design and airplane balance will allow for its installation.

REACTION TIME

"The claim that the General Dynamics airplane has a reaction time twice that for Boeing is not supportable. The reaction time for the TFX, as stated in the requirements, is counted from a standby alert—not a cockpit alert. Standby alert means the crew is in the ready shack. Typical TAC operations were studied; the time claimed for Boeing is equal to that normally required for TAC crews to run from the ready shack to the airplane plus the time normally required to taxi from the parking area to the end of the runway. This would leave no time for engine start and cockpit check. Therefore, the airplane could not react in the time shown.

Exhibit 29 should be revised to show reaction time on a comparable basis consistent with the TFX specification.

LOITER (PRIMARY NAVY MISSION)

"Loiter on station is the primary mission for the Navy. Two types of loiter mission are considered. The first of these is to loiter a short distance out from the ship for several hours. Both airplanes were evaluated as meeting this requirement. The second mission, which was assumed to take the same amount of fuel, requires shorter loiter time farther out from the ship. General Dynamics was evaluated as deficient on this mission. There is apparently an error in the evaluators' calculations which would have removed part of the deficiency but that is not important. What is important is that there is plenty of room left in the fuel tanks to add more fuel because General Dynamics has made its Navy wing a fuel tank, the same as its Air Force wing. It is available for added fuel to meet the stated loiter requirements or more. With the additional fuel, General Dynamics meets the requirements comfortably. The testimony indicates no requirements for redesign. Thus, there is no problem with the General Dynamics airplane meeting either one of these requirements. Exhibit 29 should be corrected to show the General Dynamics airplane does meet these loiter mission requirements.

INTERCEPT MISSIONS

"A word on intercept radius. The intercept radius figures shown to the Committee were not evaluated by the Air Force. Since the intercept mission is supersonic, you would expect the General Dynamics airplane, which was evaluated best in supersonics, would be better for the intercept mission. Boeing's figures show it the other way around. This appears to be a case of unjustified optimism. Exhibit 29 should be corrected to show a 'plus' for General Dynamics and the specific figures should be deleted since they are not appropriate comparisons.

INLET LOCATION

"What about selection of inlet location? An upper inlet may be better from a foreign object damage standpoint. That is, things are less likely to be thrown into the inlet which might damage the engine. But from substantially every other standpoint the lower inlet is better. The lower inlet meets the requirement which is to provide 'positive'—and that word comes directly from the work statement—positive assurance that erratic or distorted air flow to the engine will not result in any airplane flight condition. Mr. Stack indicated it might be necessary to limit the angle of attack at which the Boeing airplane could fly because of having the inlets on top. This could be extremely serious in high altitude operations and could result in engine stoppage during spins or other high angle of attack maneuvers. The upper inlet requires that the air be deflected down into the engine. A bend is also required in the tailpipe. These changes in the direction of air flow cause inefficiency.

"The lower inlet improves the inlet efficiency, thus aiding in providing General Dynamics superior supersonic performance. It simplifies on the ground inspection of the duct and the engine compressor face—and experience shows a substantial amount of foreign object damage actually comes from things left in the duct after work has been done on the airplane. It facilitates engine removal and makes it easier to change the installation to accept future engine developments. Testimony shows that the evaluation group rated General Dynamics better in propulsion system installation of which the inlets are a part.

"Troubles with an upper inlet which have to do with its characteristics in flight may not show up until after flight testing starts. Then changes are expensive and time-consuming. Conversely, the problem of protecting the engine from foreign object damage with the lower inlet can be worked out on the ground inexpensively rather

er than in flight. A quarter scale model has already been tested which indicates the effectiveness of measures being taken by General Dynamics to prevent foreign object damage.

SINGLE WHEELS VS. DUAL WHEELS

"There was some testimony in favor of dual wheels instead of the single wheels as proposed by General Dynamics on the main landing gear. The choice here involves many factors, including the shape and size of the space available for wheel stowage, the type of surface from which the airplane must operate, cost, weight, and brake capacity, to name a few.

"Some of the testimony dwelt on the difficulty of changing a wheel and tire weighing 300 pounds as compared to one weighing 130 pounds. The testimony suggests that the wheel and tire would be handled by muscle power alone. It ignores the fact that simple handling slings are used to solve the problem of lifting and positioning the wheel and tire either with or without the use of standard bomb loading equipment. These slings would be used whether the wheel weighed 130 pounds or 300 pounds. Also, we have devised a method of changing a wheel and tire without a jack, should the unlikely situation occur of having spare wheels and tires, but no jacks. Special equipment is required with either type wheel to get the tire on and off the rim.

"A point which has apparently been overlooked is that the single wheel operates with a lower pressure tire in meeting the same UCI (airfield surface) requirement, and General Dynamics actually was rated better than Boeing. The lower pressure plus the large rolling radius give the single tire an obvious advantage in rolling over rough terrain. In addition, it will not sink as deeply into soft ground, thus rolling easier and doing less damage to the field. Because it turns more slowly and has a larger radius the larger tire can have a thicker tread. This, coupled with the lower operating pressure, makes the large single tire less susceptible to cuts and increases its life. Our analysis indicates that it would only be necessary to change a tire on a single-wheel type landing gear about one-fourth as often as with the dual-wheel landing gear. The logistic and maintenance advantages are obvious, particularly when it is realized that separate records are kept on each wheel, each tire and each brake, and frequent recycling through depot overhaul and inspection is required.

"The Navy has expressed a preference for the single-wheel main landing gear.

BOMBING ACCURACY WITH OPTICAL SIGHT

"There was testimony favoring Boeing's air-to-ground fire control system because it purported to provide increased bombing accuracy. Actually this comment dealt with only a very small part of the total system—the optical sight for visual bombing. To do this requires the display of additional information on the optical glass ahead of the pilot through which he sights the target. This allows him to read such information as the slant range to the target without looking down at the instrument panel.

"This is a desirable feature from an operational standpoint. The optical sight proposed by General Dynamics is an off-the-shelf sight currently in use and was specifically suggested by the work statement. Its choice was consistent with the work statement general requirement for minimum new developments in subsystems. It can be modified to provide the additional information desired. A study is under way to allow the Air Force to determine if the added complexity is justified for visual bombing. However, it should be borne in mind that (deletion) is the complex and expensive requirement for the fire power control system. This would not be affected by changes in the optical sight information display.

(Continued on next page)

(Continued from page 2)

WEIGHT

"It has been emphasized in the testimony that the General Dynamics design is heavier than Boeing. Let's clarify the record. It was evaluated as being heavier for the Navy airplanes, but it was evaluated as being lighter for the Air Force airplanes. However, there was testimony that the weight of the Boeing-Navy airplane would have to be revised upward to raise the speed to a figure comparable to General Dynamics. Also, for Boeing to provide wing fuel tanks like General Dynamics would require an increase in the Navy weight.

GROWTH CAPABILITY

"The opinion has been expressed that the Boeing design has the greatest growth capability. By growth we assume this means growth in operational capability. The Boeing design is already bigger physically than the General Dynamics design.

"Growth in the basic TAC mission will come easier to the General Dynamics airplane because of its better supersonic design. A proposal for range growth on this mission was presented with the proposal. This consists of a (deletion) which was recommended for study and development. Growth to higher supersonic speeds at low altitude is also enhanced by General Dynamics' better supersonic design and stronger structure. Growth in ferry range and load-carrying capacity for the Air Force airplane is ensured by the option of using the Navy wing tips and the Navy landing gear as described earlier. Growth in loiter capability for the Navy is assured by the excess fuel tank capacity which is available for use at any time because General Dynamics provided an identical fuel-tight wing structure for both the Air Force and Navy as a feature of its commonality approach.

"We have talked about the airplane, now let's consider other aspects of the program.

COST

"Ultimate program cost, not estimates, is the prime consideration. So let's look behind the numbers stated in the cost estimates.

"There are many features of the General Dynamics-Grumman TFX program which support our conviction that our program will cost less than the program proposed by Boeing.

"Some of the most positive cost saving features are as follows:

- "Fewer total number of parts
- "Fewer uncommon parts
- "Less expensive materials
- "Simpler engine installation
- "Conventional speed brakes
- "Less structural testing
- "Fewer drawings
- "Fewer instructions
- "Fewer 'similar parts' which look alike, but aren't
- "Extensive and current manned supersonic aircraft experience
- "Extensive and current carrier based experience
- "Specific variable sweep wing experience
- "Better rating in the Fourth Evaluation in the area of 'Production, Management and Cost.'

"In all discussions with the military, cost realism was emphasized. A firm commitment was required covering the RDT&E portion which represents only about 10 per cent in dollars of the total planned program. Realistic and accurate estimates were requested for the production phase and it was evident that this was for Air Force planning purposes to avoid surprise in future budget estimates.

"General Dynamics adhered strictly to these ground rules in preparing its proposal. We did not price the RDT&E program at a loss. It stands on its own in that it does not plan to carry over into production any cost items that properly belong in RDT&E. To be sure, it is a close price but if the program is performed as planned, we will make a reasonable profit.

MATERIALS

"GD's decision to use steel and aluminum as a primary material of construction rather than titanium was based on weight, cost, fatigue characteristics, maintenance and other considerations. GD has used titanium in many applications over the years; it was considered seriously for several places on the TFX. Titanium is, however, at least several times as expensive as steel and aluminum. Its properties are not as well known in the thicker gages which would be required to utilize it extensively in the heavier parts of the structure such as the wing carry through and wing box. Specifically, the data available on fatigue properties show more scatter than for steel, i.e., there is more difference in quality between the worst piece and the best piece. To design conservatively for long life, it is necessary to add enough material to account for the poorest quality piece you might expect. This would cancel part of the weight saving otherwise possible. Also, it was found that the size of titanium plate available was smaller than aluminum so that an additional splice would be required in the wing structure. This ate up a little more of the potential weight advantage. The increased cost for the titanium applications we studied was about \$115,000 per airplane. With these factors in mind, it seems to General Dynamics that steel and aluminum offers the better alternative for most applications on the TFX.

EXPERIENCE

"General Dynamics has more experience than any other contractor in the design and manufacture of supersonic aircraft. The F-102, F-106 and B-58 programs have given GD over 50,000 hours of supersonic flying. Boeing has yet to build its first supersonic manned aircraft. Grumman has had carrier based supersonic fighter experience with its F11F. Grumman airplanes have made more than 1/2 the carrier landings and takeoffs in the history of the U.S. Navy. Grumman has built and flown a variable sweep jet fighter, the XF10F. The General Dynamics-Grumman team had under its belt 4,330 hours of wind tunnel testing and full scale design and construction experience on the XF10F and 4,758 hours of wind tunnel testing on the TFX when the proposal was submitted.

"In over a year of flight testing of the XF10F, its wings were swept and unswept in the air on substantially every flight without difficulty. This conclusively demonstrated the feasibility of the variable sweep concept. This obviates the need for a special prototype program to duplicate this experience before proceeding with the TFX program.

The F-102, F-106, F-11F, XF10F, and B-58 are as close as you can get to the TFX in terms of experience. As guided missile and subsonic SAC heavy bomber are a long way from it. The General Dynamics-Grumman experience in these pertinent programs will save the government and the contractors time and money in learning.

"If experience is worth anything, the GD-Grumman team is clearly ahead for the job to be done.

BI-SERVICE REQUIREMENT—COMMONALITY

"General Dynamics better met the clear requirement for a bi-service aircraft. From the outset, the emphasis was on development of a weapon system that provided minimum divergence between the Air Force and Navy versions. The recurring theme throughout the procurement actions was that changes to the Air Force tactical version of the basic aircraft to achieve the Navy mission were to be held to a minimum. It was explicitly set out as a vital condition in the Defense Department's letter of July 13, 1962, to both companies prior to the submission of the last proposals.

"GD took its customer seriously in this regard and was responsive. GD's commonality approach achieved one aircraft with

the minimum divergence requested. The fuselage, wing, and tail of both versions of the General Dynamics TFX are structurally the same. The Navy wing tips are simply bolted on. The Fourth Evaluation Report found that General Dynamics proposed an airframe design that has a very high degree of identical structure for the Navy and that in the two Boeing versions less than half of the structural components of the fuselage, wing, and tail were the same. The Evaluation Group concluded that Boeing, in effect, proposed two different airplanes structurally.

"General Dynamics' greater commonality was not the result of a sacrifice of performance in pursuit of a commonality goal as such. Rather it came as a bonus from a better idea on how to satisfy and reconcile the differing performance and structural strength requirements of the two services. Dr. Brown quoted a Navy evaluation briefing as describing our bolt on wing tips as 'an elegant and preferred solution.' Gentlemen, there have not been significant performance sacrifices for the sake of commonality or economy. On the contrary, the bolt on tips, the interchangeable landing gear, the common wing fuel tank and the strength for the same top speed for the Navy and Air Force have been shown to provide performance bonuses when advantage is taken of them. We can be certain that our TAC and Navy operators will think of many more uses than we have suggested. You are, in fact, buying a better and more versatile airplane because General Dynamics came up with a better idea.

"There are several tests of the accuracy of a commonality figure. Are they about the same by weight as by parts count? Under a different definition of parts, are they about the same? We have applied these tests and the results are as follows:

"by AMPR weight	91.9%
"by structural assembly count	90.0%
"by weight empty	89.7%
"by structural parts count	88.5%
"by AMPR parts count	85.2%
"by structure and equipment (without avionics)	83.6%
"by complete airplane including avionics	83.2%
"by fabrication tools required	85.0%

"We have observed that several of the witnesses have attempted to disregard commonality as a cost saving feature with a simple reference to Boeing's lower quote. Also some confusing testimony has been given about similar parts being as cheap as identical parts because the same assembly fixtures may accommodate parts having certain types of differences. But assembly tooling is only part of the story. Each part must be fabricated as a separate unit. On the average about 2.5 fabrication tools are required per part.

"The use of techniques such as numerically controlled machines in the manufacture of parts for modern airplanes has been cited and is recognized as offering substantial economies by reducing fabrication tooling cost. For the last five years, General Dynamics has used tape controlled machines in the fabrication of production parts. Many of our suppliers are using these machines and realizing substantial savings.

"The actual forming, milling, guiding, drilling, and finishing of a part is not the major part of the total task required to incorporate it as an item in the delivered product. The major cost is generated by the need for designing, drawing, releasing, getting material, testing, transporting, listing, stocking, analyzing, segregating, inspecting, identifying, and installing each part as a separate item by part number.

"No matter how small the difference is between two non-identical parts, each of the actions I have mentioned must be accomplished distinctly for each part

number. Of the total parts in the airplane less than 5% will be made on a numerically controlled mill.

"It is well known in industry that the design, development, test, production and support costs for a number of identical weapon systems are less than such costs would be for a mixture of two different weapon systems. The higher the degree of identity the more the savings.

"The logistic support people are aware of the savings obtained by reducing the number of different stock numbers required to be carried in the system, and the dangers present in having similar parts which look alike but have different strengths or other characteristics which might inadvertently get installed on an airplane with catastrophic results. This is a serious problem in peacetime with elaborate controls. In wartime it can become a monumental problem.

ADDITIONAL ADVANTAGES

"Testimony has been submitted which shows that in the Fourth Evaluation Report General Dynamics' superiority in the following significant areas were listed.

- "1) Better structural design
- "2) A higher rating in the 'Production, Management and Cost' area
- "3) A better 'scheduling' program
- "4) An edge in supersonic maneuverability at altitude
- "5) Better proposed programs in the Personnel Subsystem and Aerospace Ground Equipment
- "6) A slight edge in the flight control area
- "7) A low radar cross section and an integrated penetration aids system

COMPETITION

"General Dynamics believes in competition. To be equitable, any competition must take place under ground rules which are known and understood by the competitors and by the judges. In the case of the TFX, these ground rules consisted of the Work Statement and associated instructions plus the directives from the Department of Defense.

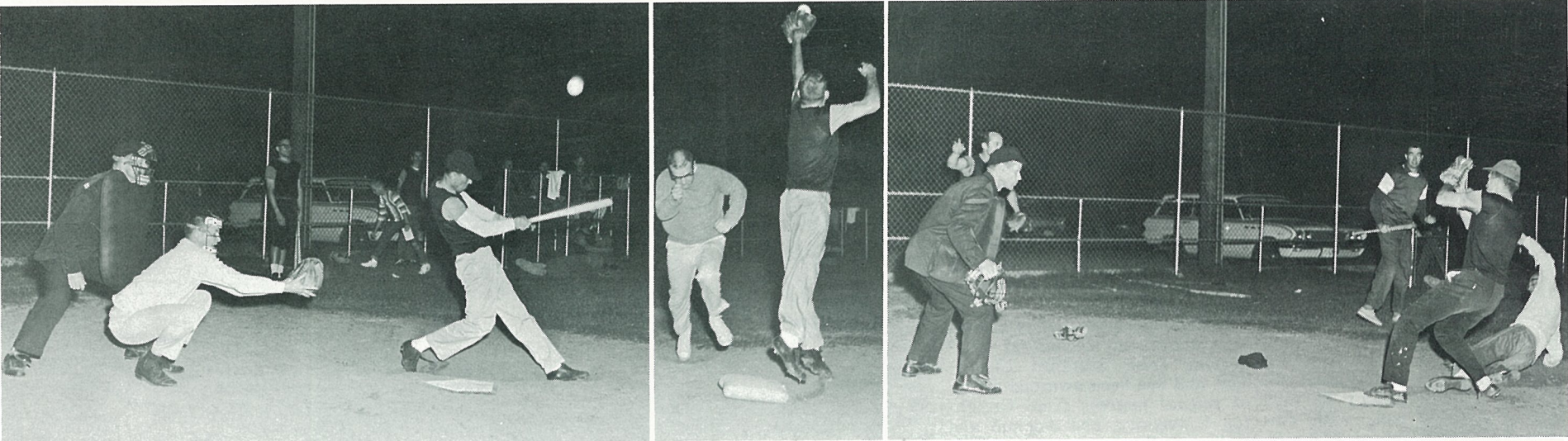
"There are over 1,600 requirements of one kind or another set forth in the Work Statement, not including those applicable by reference to other specifications which number in the thousands. A great deal of the 275,000 man-hours spent by the evaluation group was directed toward measuring the degree to which the competitors met the requirements of the Work Statement. Their scoring is perhaps the most valid measure of each competitor's performance against the rules of the competition established by the Work Statement. You will recall that both the raw score and the weighted score favored General Dynamics. This is a basic fact that cannot be disregarded.

"The degree to which the second set of ground rules, i.e., the Department of Defense Directives, were met was properly judged by the Department of Defense itself, and in this framework of rules, General Dynamics again won the competition.

"In short, a careful review of the testimony and the facts will support the conclusion that General Dynamics properly won the competition.

CONCLUSION

"The TFX is extremely important to national defense. It is more than just another airplane. Once we decided to compete for it, we went all out. We designed the plane to the highest standards of excellence to meet the fundamental objectives. We have been hard at work developing it for our customers ever since notification that we had won the competition. Everything I have learned since then, including the information produced at these Hearings, convinces me that our margin of superiority is substantial. I believe we have a solid basis to confirm to you that the General Dynamics' TFX is a very superior weapon system and that the program presently planned will be achieved at the lowest possible cost to the taxpayer."



PLAY BALL—There's plenty of action in GD/FWRA Softball League play, as indicated in Grumman's 5-1 conquest of Dept. 19-3. Left photo, R. J. Ballard, 19-3, blasted out a base hit. Center, Grumman's Charley Connors arrives at first base about the time Al Lamb takes throw. You be the umpire! At right, Pitcher Audrey Majors, Dept. 19-3, forces Ed Merriam at home plate. Double-headers will continue three times a week through July.

Cowpokes Prepare For Annual Spring Rodeo; Admission Free

T. M. Smith, Dept. 87-1 and Dick May, Dept. 7-4, are chairmen for the GD/Fort Worth Ranch Riders' Annual Spring Rodeo to be held at 3 p.m. June 16 at GD/FWRA Ranch Area.

"This will be a full-fledged rodeo," said Commissioner Claude Schmidt, "with top-notch cowboys and cowgirls from GD/FW participating along with specially invited outside cowpokes.

Admission will be free.

Events include bareback riding, calf roping, steer wrestling, and bull riding for the gents, and barrel-racing for the female entrants.

The barrel-racing event will be divided into two parts. Members of the Texas Barrel Racing Association will stage an exhibition, followed by a barrel-racing event for GD/FWRA participants.

Ten contestants will ride in each event with the top three di-

viding the purse. Prizes for GD/FWRA barrel racers will be announced later.

Entry fees for all events except barrel racing will be \$10. Fee for barrel racing is \$2.

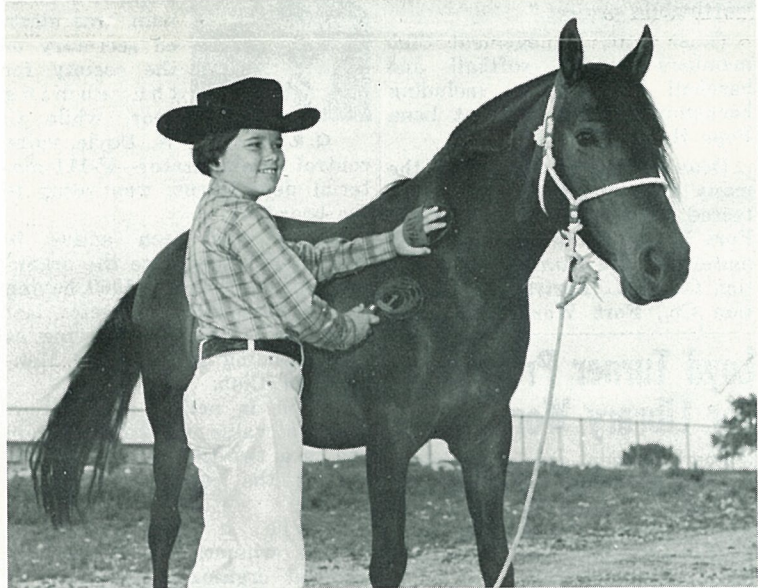
"All GD/FW people who wish to enter any of the events should sign-up and pay entry fee in the inplant recreation office by May 24," said Smith.

"Any person who wishes to ride in the grand entry is invited to do so," Schmidt said. "At no charge, of course."

Special events of the day will include the Calf Scramble for children six and under and 12 and under. A local drill team will set pivots.

Jack Ratjen from Mansfield will produce this year's rodeo.

Schmidt says there will be plenty of free parking space available, and soft drinks and sandwiches will be available.



READY FOR RODEO—Terry Roberts, daughter of W. A. Roberts, Dept. 93, readies her horse "Lady" for next month's rodeo in which she plans to compete. Although only 10 years of age, Terry is a veteran rodeo performer.

Yankees and Giants to Open Minor League Play Tonight at Recreation Area

Yankees will battle the Giants and Mustangs will take on the Bobcats tonight at GD/FWRA diamond in the first minor league baseball game of the season.

Game time for the Yankee-Giant fray is 6:30 p.m. Mustangs meet the Bobcats at 8 p.m.

The freshman league was scheduled to open season play last night with the Panthers meeting the Pirates at 6:30 p.m. and the Eagles playing the Indians at 8 p.m.

Other first-week-of-the-season games:

Freshman League: Pirates vs. Eagles, 6:30 p.m.; Panthers vs. Indians, 8 p.m., May 16. Minor League: Giants vs. Bobcats, 6:30

p.m.; Yankees vs. Mustangs, 8 p.m., May 17.

Minor League will play two games each Wednesday and Friday through July 19 and the Freshman League will play double headers each Tuesday and Thursday through July 18.

The five teams in the Sophomore League will begin play June 4. Teams are Cubs, B-58, Rockets, Bucks, and Teeners.

Price Takes First In Pattern Event

C. L. Price took first place in the AMA pattern event, a part of the recent radio-control contest held by the Model Airplane Activity at Benbrook Lake.

Second place winner was J. F. Shepherd, and third place was taken by C. W. Austin.

First place in spot landing event was copped by Tim Krog and Shepherd came in second.

A free-flight contest is scheduled at 1 p.m., May 19, at Benbrook Lake.

Softball League Continues Play

Bombers and Ex-Bombers are scrambling for the lead in recently started GD/FWRA Softball League play.

The Bombers blasted their way to four loop victories in the first two weeks of competition, while Ex-Bombers garnered three victories.

Third spot was occupied by Grumman in early-May, followed by Tacrats, McDonnell, Dept. 19-3, and Special Projects.

The Grumman crew opened with a 5-1 win over Dept. 19-3 in a battle of unearned runs. Ed Merriam set the GD/FW team down with three hits.

Regular league play will continue with three-a-week double-headers at the GD/FWRA softball diamonds.

Two games each—at 7:30 and 9 p.m.—are scheduled for each Tuesday, Wednesday and Thursday night through July, Commissioner Raymond Evans announced.

GD/FWRA softball teams and managers are: Ex-Bombers, J. L. Townley; Dept. 19-3, R. J. Ballard; Grumman, Steve Honig; Special Projects, Jerry Parrish; Bombers, Frank Javarone; Tacrats, Al Pecarello; and McDonnell, R. W. Hickman.

Invitation Extended to Junior Horse Show

"Everyone's invited."

These words come from Ranch Activity Commissioner Claude Schmidt who invites all GD/FW employees, their families, and guests to the annual GD/FWRA Invitational Horse Show Saturday at the Ranch Area.

Registration begins at 8:30 a.m. and show starts promptly at 9:30 a.m.

Scheduled events are western horsemanship, ranch riding, western pleasure, reining, keyhole racing, pole bending, barrel racing, and flag facing.

Show will conform to rules adopted by the Texas Junior Horse Show Association and will be judged accordingly, with judges decisions final in all events.

Soft drinks, lunches, and snacks will be available on the grounds.

Hall and Walker Land Prize Fish

GD/FWRA's champion fishermen for the months of March and April were C. H. Hall, Dept. 166-1 and L. P. Walker, Dept. 62.

Hall's catch of a 7 lb. bass and a 7 lb. 3 oz. bass was made at Lake Leon, while Walker pulled two crappie weighing 2 lb. 6 ozs. and 2 lb. 9 ozs. from Lake Benbrook.

Consolation prizes for March were awarded to K. J. Preston, Dept. 7-6 for his 7 lb. 2 oz. bass caught at Lake o' the Pines, and C. E. Roeder, Dept. 8, for his 2 lb. 4 oz. crappie reeled from Lake Benbrook.

Fishermen should register their catch in the inplant recreation office to be eligible for monthly prizes, according to Commissioner Bill Parrish.

Recreation AND SPORTS

Singing Hills

Golf Sweepstakes Planned May 25; April Winners Named

This month's golf sweepstakes will be played May 25 at Singing Hills Golf Course, announced Commissioner L. H. Armstrong.

"This will be an individual handicap affair," said Armstrong, "and players are asked to make up their own foursomes."

There will be four classes, based on handicaps, and players may choose their own teeing-off

time. Prizes will be awarded low net and low gross in each flight.

Anyone who doesn't have a handicap registered in the GD/FWRA office may bring three current attested score cards to the inplant recreation office and a handicap will be established.

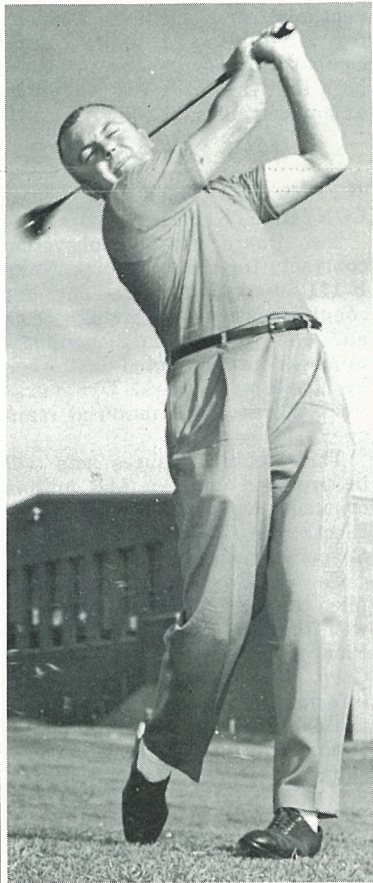
Entry fee is \$1 per player. Green fees are additional. Deadline for registration in the inplant recreation office is May 24 at 4:30 p.m.

In April sweepstakes, Al James took low gross and R. R. Christensen low net in first flight play.

Second flight winners were L. T. Clark (low gross) and G. A. Hutchinson (low net).

Third flight was taken by H. M. Ruby (low gross) and R. M. Bailey (low net), and F. A. Schad and B. F. Johnson took low gross and low net respectively in fourth flight.

All winners of April sweepstakes were given tickets to the Colonial Golf Tournament.



SWINGING — Weldon Dyer, Dept. 65, gets in practice in preparation for GD/FWRA Golf Sweepstakes this month. Dyer is shown practicing at Z. Boaz Golf Course where he was joined by several other GD/FWRA golfers.

Classes Still Open For Tennis Buffs

Places are still open in both tennis classes and the adult tennis club, according to Commissioner E. T. Smith.

Classes for both adults and children, age nine and over, are scheduled to begin the first part of June.

Fee for classes is \$5 for the season, and adult tennis club dues are \$5 per year.

Classes will be instructed by Warren McMillan, tennis pro at Rivercrest Country Club.

Eight 30-minute lessons will be offered, with lessons scheduled every other week through Sept. 19.

Those interested in either the classes or the adult tennis club should contact Smith at ext. 3163, or AX 2-0181.

Volleyball Classes To Start May 23

Volleyball instruction for boys and girls from 10 to 13 years of age will start May 23 on the outdoor volleyball court in Picnic Area No. 1.

Classes will be from 6:15 to 6:45 p.m. followed by actual play.

Classes and play will continue every other Thursday throughout the summer months.

The Passing Years

The following emblems were due during the period May 16 through May 30:

Twenty-year: Dept. 3, M. S. Williams; Dept. 4, C. Dannenfelser, R. G. Hankins, R. B. Stangl.

Dept. 14, V. S. Owens; Dept. 20, P. C. Keahey; Dept. 22, R. W. Hooper, T. F. McAden; Dept. 24, E. Cunha, W. K. Deaton, C. D. Lines.

Dept. 29, W. F. Arwine; Dept. 32, R. Grissom, E. B. Hill, W. H. Moore; Dept. 41, H. V. Bordovsky.

Dept. 50, R. O. Fancher; Dept. 53, T. L. Goodwin, R. M. Webb, H. C. Worthey.

Dept. 65, M. L. Brogotti, M. E. Clarke; Dept. 82, T. Lankford, T. Myers, C. R. Wilson.

Dept. 93, N. L. Marr; Dept. 95, J. Worsham; Dept. 96, E. A. Nicholson, T. M. Sheffield, C. E. Wyatt.

Dept. 97, W. O. Hudler, F. T. Vowell; Dept. 160, E. V. Gish, G. B. Henry.

Dept. 260, R. A. Dvorak, E. J. Luedtke; Dept. 346, E. Hood, B. N. McKinney, L. E. Mimms, T. R. Mitchell.

Fifteen-year: Dept. 3, J. D. Tate; Dept. 4, E. O. Jordan; Dept. 7, G. C. Easley; Dept. 9, E. H. Bowman.

Dept. 14, A. J. Rose; Dept. 17, D. L. Harper; Dept. 22, M. E. Cochran; Dept. 24, B. L. Barker, C. M. Walker.

Dept. 27, R. D. Thompson; Dept. 36, H. L. MacLain; Dept. 73, C. F. Hall.

Dept. 75, S. W. Stewart, B. L. Wood, J. D. Wood; Dept. 83, A. C. Hicks; Dept. 94, F. J. Balik, R. J. Grana.

Dept. 96, C. W. Gillispie; Dept. 260, T. G. Sanderson Jr.; Dept. 280, J. S. Montgomery.

Dept. 346, R. W. A. England, J. N. Kimbrough, J. C. Shields, F. Spearman, A. L. Vrba.

Ten-year: Dept. 11, M. G. Stair; Dept. 22, C. L. Sales; Dept. 62, R. G. Schmitt Jr.; Dept. 160, L. W. Jones; Dept. 260, L. E. Erwin.

GD/FW Employees, Wives Invited To Hear Gen. Schriever Speak

Gen. B. A. Schriever, commander of Air Force Systems Command, will be speaker and honored guest at a meeting of the Fort Worth A&M Club May 17 in the Grand Ballroom of Hotel Texas.



Title of his speech will be "Man and Technology in the Space Age."

Reception will start at 6:30 p.m., with dinner at 7:30 p.m. Cost is \$5.50 a person. GD/FW employees and their wives and guests are invited.

Special guests will include a host of top-ranking military officials, plus top representatives from industry, including: Frank W. Davis, GD/FW president; E. J. Ducayet, Bell Helicopter Co. president; and Gifford Johnson, Ling-Temco-Vought Inc. president.

Olin E. "Tiger" Teague, congressman from 6th Congressional District and member of the House Science and Astronautics Committee, will introduce General Schriever.

The speaker started his career after graduating from Texas A&M in 1931 by accepting a reserve appointment in the field artillery.

After several assignments, he reverted to inactive reserve status and became a pilot for Northwest Airlines. He re-entered the service as a second lieutenant in the then Regular Army Air Corps in 1938.

In June 1942, Schriever, then a major, joined the 19th Bomb Group in the Southwest Pacific,

participating in seven campaigns while in that theater.

He held a number of top post-war positions, including that as commander of Air Force Ballistic Missile Division. In this capacity, he directed the nation's highest priority project—development of the intercontinental ballistic missile.

General Schriever holds a master's degree in mechanical engineering from Stanford University, and has been awarded doctor of science degrees from Creighton University, and Adelphi and Rollins Colleges.

Tickets for the event are available through F. E. Armstrong, Dept. 61-3; R. P. Scott, 267-0; J. R. Vaughan, 163-4; C. E. Hart, 166-1; C. W. Cooper, 65; R. H. Sumner, 65-2; H. R. Tomlinson, 268-5; J. G. Heit, 165-1; B. B. Shuffler, 264-2; Arnold E. Northcott, 24-1; Walter Hill, 3-4; Sherwin Rubin, 304; and A. H. "Andy" McMahon, 16; Earl Hatchett, 189.

Westinghouse Gets F-111 Task

(Continued from Page 1)

stant speed drive assembly, voltage regulator and generator control unit, current transformer assembly, and constant speed synchronizer.

The F-111 will fly at speeds up to two and one-half times the speed of sound; land or takeoff on carriers and short, rough airstrips, vary the sweep of its wings in flight; carry both conventional and nuclear weapons for air-to-air and air-to-ground combat; and serve the needs of both the Air Force and Navy, the announcement said.

★ ★ ★

MAJOR SUBSYSTEM CONTRACTS LET

Two more major subsystem contracts for the Air Force/Navy F-111 tactical fighter—one for countermeasures receiving sets and one for air data computer units—were completed last week by R. Kahn, General Dynamics/Fort Worth F-111 material manager.

The countermeasures sets will be provided under a \$4.2 million contract with the Lima, Ohio, Electronics Division of AVCO Corporation.

The data systems will be supplied under a \$990,000 contract with the Teterboro, N.J., Eclipse-Pioneer Division of the Bendix Corp. The systems will gather information on air through which the F-111 travels, and feed it into flight control, navigation, and flight instrument subsystems.

Hartwig Transferred To Electric Boat

R. C. Hartwig, chief of systems and procedures and data processing at General Dynamics/Convair, transferred the first of this month to Electric Boat Division as manager of systems and procedures.

Hartwig has been with General Dynamics Corporation since 1955 when he joined GD/Fort Worth as manufacturing engineer. He transferred to GD/Convair in 1961 in applied manufacturing and research and was promoted to manager of systems and procedures and data processing early in 1962.

For the time being, G. O. Withem, chief of data processing, and B. W. Kahla, chief of systems and procedures at GD/Convair, will report directly to W. R. Bruce, director of operations.

TECHNICAL CHALLENGE OF F-111 DISCUSSED

E. B. Maske, director of aerospace technology, GD/Fort Worth, spoke on "Technical Challenges of the F-111" at a meeting of Society of Automotive Engineers recently at Western Hills Hotel.



GOOD DEED—Barren bit of land at Lena Pope home was recently converted into combination basketball-volleyball-tennis court by Management Club volunteers. Facility will include movable backboards and removable poles.

Technical Courses Offered at GD/FW In Radio, Electronics

Technical Institute courses in shorthand, electronics and radio are slated to begin soon at GD/Fort Worth. Other courses may be offered if interest warrants.

Courses already scheduled are: Electronics Phase I: a 60-hour course from 4-7 p.m. Thursdays in Room 108C starting May 16. Cost is \$15. B. T. Adams is instructor.

FCC Radio Telephone Operators Course (Second Class): 75-hour course to be held from 7 to 10 p.m. Mondays and Wednesdays in Room 108C starting May 20. Cost is \$15. Instructor is Richard Carlson.

Beginner's Shorthand: 50-hour course from 5-8 p.m. Monday nights in Room 108C starting May 20. Lois Ream is instructor.

Intermediate Shorthand: 50-hour course from 5-8 p.m. Thursday nights in Room 108C starting May 23. Instructor is Barbara Reeder.

Advanced Shorthand: 50-hour course from 5-8 p.m. Tuesday nights in Room 108C starting May 21. Lee Ann Oney is instructor.

Charge for any of the three shorthand classes is \$12.50.

If enough interest is shown, classes may also be offered in Programming, Transistors, Production Illustrations, and Pert Time and Cost.

Employees interested in attending any of these courses is invited to contact either Jess Butts or C. E. Nevitt Sr. (ext. 3442) of educational services.

30 to Receive Study Awards

Thirty employees are to receive various management study awards at the Management Club meeting this month at GD/FW.

Certificates are periodically awarded to employees who complete prescribed courses in a program sponsored jointly by Management Club and Texas Christian University.

Receiving associate certificates for 30 hours are: J. N. Franks, 346; B. R. Dingler, 260; Dan N. Harper, 65; O. R. Henderson, 73; Arthur K. McKinney, 102-1; Robert R. Massegee, 28-6; Marvin E. Miller, 27-1; John F. Mohrbacher, 307-1; Everett L. Wheeler, 280-3; Arlie V. Cato, 9-1; Elton H. Langford, 19-4; Charles E. Germany, 24-4; J. D. Farrell, 9-4; and Glenn C. Easley and L. R. Cox, 7-7.

Certificates in management for 60 hours: J. S. Case, 7-7; Fred C. Shipley, 7-6; O. B. Moberly Jr., 24-4; Albert O. Watson, 8; Allen I. Wexler, 160; Joe Lingerfelt Jr., 280-3; and Billy L. Allard, 9-2.

Advanced certificates in management for 90 hours: Gene L. Jackson, 260; and G. F. Hollingsworth, 280-1.

Graduate certificates in management for completion of 12 hours toward master's degree: Homer E. Boyd, 75; R. M. Geisler, 105-3; Victor K. Reeser, 25-2; Harold P. Owen, 65; Edwin R. Buford, 105-3; and Milton D. Myers, 3-7.

'Convertible' Playground Built For Lena Pope Home Children

Management Club volunteers last week completed construction work on a \$4,500 combination cement basketball-volleyball-tennis court at Lena Pope Home.

About 20 club members turned out May 4 for concrete-pouring, and an estimated 35 volunteers performed "clean-up" operations last Saturday.

The new 60-by-120-foot "convertible" playground is marked off into regulation-size basketball, volleyball and tennis courts. Rolling basketball backboards and removable poles for volleyball and tennis courts facilitate erection of any of these facilities in a matter of a few minutes.

"The kids appeared to be quite pleased over the new layout," said G. S. Dean, chairman of the Lena Pope Home Committee.

"Since the Home is allowed only about \$100 a year for recreational facilities, the Management Club felt this to be a very worthwhile project."

(Last year, Management Club members erected softball and baseball diamonds — including backstop and fences — at Lena Pope Home.)

Dean expressed thanks to the many Club members who volunteered their efforts, and to the Fort Worth firms which donated materials: Joe Starkes Construction Co., J. L. Bertram Construction Co., Fort Worth Sand and

Gravel, Prater Concrete Co., Central Concrete Co., Fort Worth Concrete Co., Industrial Concrete Co., Texas Bitulithic Co., Joe Adams and Son, Nick Roselund, and Paulsel Lumber Co.

Assisting Dean on the planning committee were Marvin Messersmith, F. B. Thompson, and John Dillman.

VALUE ENGINEERS ELECT CREASY TO DIRECT CHAPTER

Q. R. Creasy, deputy value control coordinator at GD/Fort Worth, was recently elected president of the Dallas-Fort Worth Chapter of Society of American Value Engineers.



L. R. Parvin, Dept. 7-3 foreman, was elected secretary of the society for the coming year, while C. W. Doyle, value control administrator—F-111 material department, was voted to the board.

Creasy has been active in SAVE activities since the organization's inception in 1960, having served as publicity director last year. He is currently serving as corresponding secretary of Management Club.

Parvin is active in GD/Fort Worth's value control program and is a two-time winner (1954-55) of the coveted President's Award.

Doyle, a 1959 President's Award winner, served on the national organization's board of directors last year. He has appeared nationally as a speaker on value engineering.

Dallas-Fort Worth chapter of SAVE was lauded by the national organization recently for being "the first chapter in the nation to become active." Today, 28 chapters are active, and others are organizing.

'Six Flags' Rates Cut for GD/FW

(Continued from Page 1)

regular admission prices. Air Force and technical representatives at GD/FW and their families are also entitled to the special rates.

Six Flags opens at 10 a.m. and closes at 8 p.m. on both days.

Admission cost entitles the individual to all rides, shows and special attractions. Parking is 50 cents. Souvenirs, food and refreshments may be purchased if desired.

A new attraction at Six Flags this year is "Boom Town," which houses an old-fashioned carousel with 66 hand-carved horses and chariots, a traveling puppet show, a hobo jungle, and the "Sky Hook."

The latter attraction, a feature of the 1958 Brussels World Fair, towers 155 feet in the air and carries aloft 28 people at one time in steel baskets suspended from cables.

As the upward bound baskets pass a control house part way up, the entire structure slowly revolves 180 degrees, presenting riders with a view of Dallas and Fort Worth skylines.

Nicholson and Hay Earn April Honors

(Continued from Page 1)

segregating contract data for special analysis.

Hay suggested making a tool which could be attached to the B-58 aft turret, permitting a hole to be drilled without removing and replacing the turret outer ring.

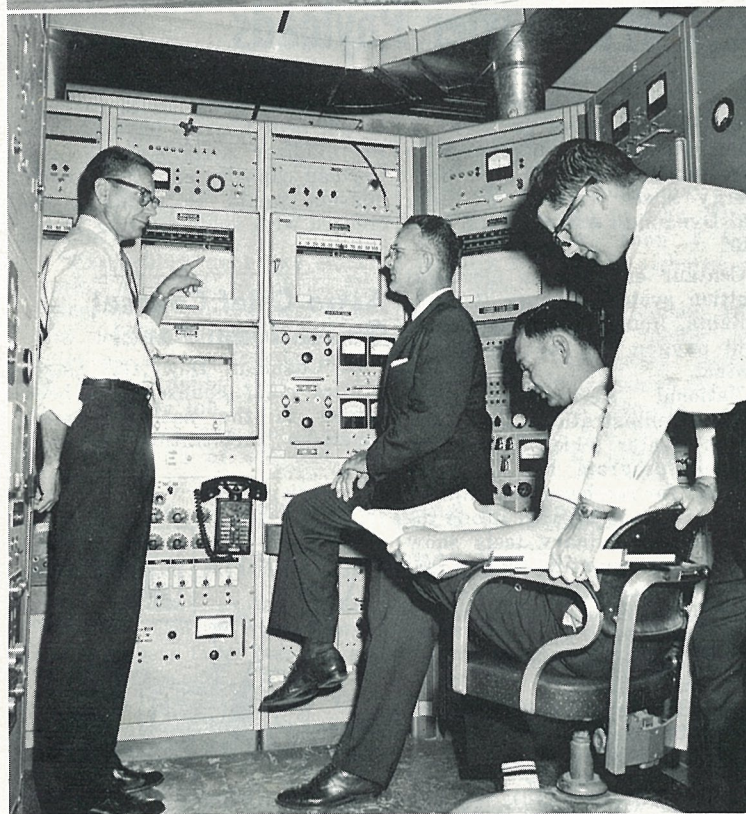
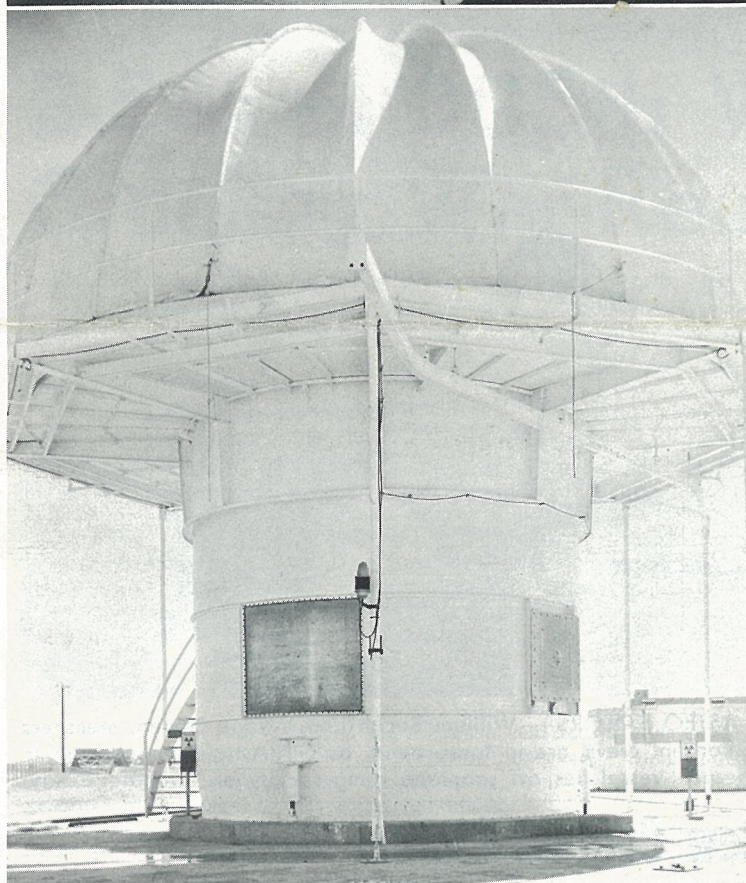
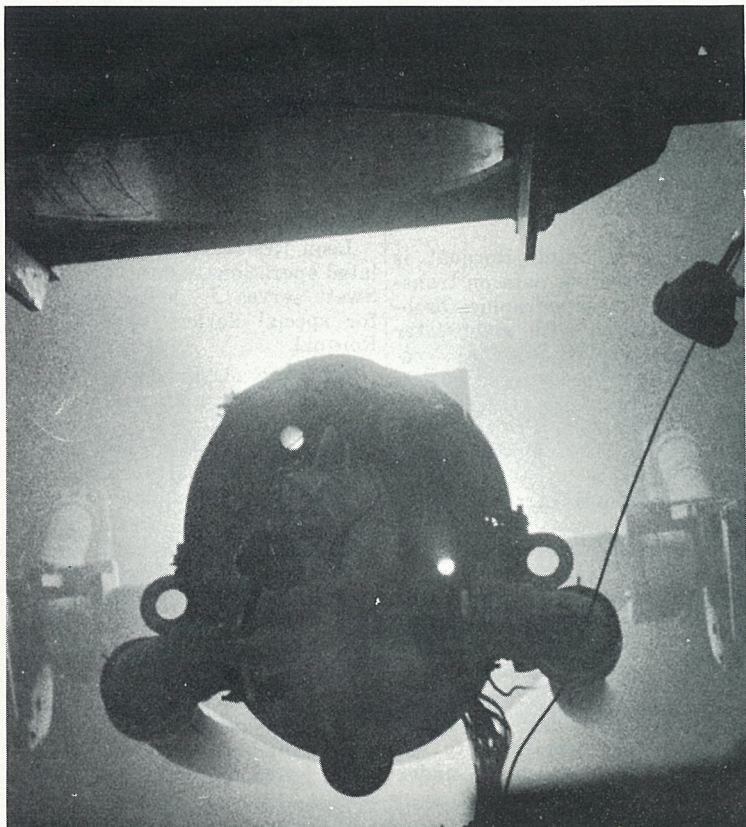
Before this, the turret ring had to be removed and replaced in the process of modifying Hustlers. Installation cost was \$43.

FLIGHT ENGINEER AUTHORS ARTICLE

An article by Robert D. Bronson, senior flight test engineer at GD/Fort Worth, appears in the April issue of Space Aeronautics Magazine. It is entitled, "Semi-Automatic Calibration for Linear Accelerometers."



FAST FLIGHT — Brig. Gen. Irving L. Branch, right, AFFTC commander, receives Mach 2 certificate from George Clifton, GD/FW representative at Edwards AFB. Lt. Col. Kenneth Lewis, chief of bomber test operations at Edwards, flew general twice speed of sound in B-58 Hustler.



POWER BOOST—Increase in power for GD/FW's Aerospace Systems Test Reactor was authorized recently. At top, intense glow is evident, even when reactor is operated under water. In center, protective covering gives umbrella effect. Below, from left: E. J. Brunner and H. R. Dvorak, director of nuclear research and development, C. W. Dickenson and D. F. Ross, all Dept. 064.

Test Reactor Power Level Given Boost

Authorization to increase operational power level for GD/Fort Worth's Aerospace Systems Test Reactor (ASTR) from 3 to 10 million watts has been granted by the Air Force Atomic Energy Commission.

"After proof testing, this reactor will be used for qualification testing for NERVA (nuclear rocket) and other space programs," said H. R. Dvorak, director of nuclear research and development.

Dvorak said that added power of the ASTR gives GD/Fort Worth an increased capability in this area, above and beyond the type work already being done for AEC and others.

In addition to component testing for the NERVA program, the new reactor will also be used in connection with existing projects, such as: liquid hydrogen heating experiments and radiation heating in structural materials.

Bill Price, chief of nuclear design and operations, made a presentation to the statutory Advisory Committee on Reactor Safeguards on the ASTR power level increase May 12. Approval was granted shortly thereafter.

Dvorak added that the new 10 million watt capability will help in other experimental work such as: penetrating through thicker shielded materials; obtaining faster dose rate data with better counting statistics; obtaining more variation in neutron-to-gamma ratio and in neutron spectra variations; and experimenting for future nuclear-propulsion systems at higher power levels and shorter run times.

"This latest authorization represents still another step in a series to increase the test capability of ASTR," Dvorak said.

ASTR was designed for operation in a shielding program and was flown inside a modified B-36—the only reactor ever operated in a flight vehicle. It was subsequently modified to operate at 3 million watts.

Key personnel assisting in the program were: E. J. Brunner, assistant project engineer; Reuben Fields, staff scientist; Jack McWhirter, nuclear physicist senior; Roy Lawrence, Denny Ross, Fred Leopold, Al Chura, and E. L. Jordan, nuclear engineers senior.

Also R. H. Brickley, test engineer senior; C. W. Dickenson, nuclear engineer; Frank Paschal, health physics administrator; Bob Clemmer, Ruth Williams, and Reagan Haygood, engineer illustrators.

PROFESSORS EARN EXCELLENCE AWARDS

Dr. C. O. Harcourt, assistant professor of electrical engineering at University of Texas, and Prof. S. A. Lynch, head of department of geology and geophysics at Texas A & M, have been awarded GD/Fort Worth's 1963 "College Excellence in Teaching" awards.

Each received \$1,000 awards for "promoting excellence in teaching."

R. H. Widmer, vice president-research and engineering, made the award to Dr. Harcourt at a ceremony on campus May 20.

A similar presentation was to Prof. Lynch by Dr. E. L. Secrest, chief scientist, at Texas A & M, May 17.

E. J. Horton, engineering group administration supervisor, was present at both presentations.



OFF AND RUNNING—B-58s on active duty with SAC are in continuing state of readiness. Above, B-58 crew at Bunker Hill AFB races from underground quarters as alert sounds. For account of Hustlers at Bunker Hill, see page 3.

Carswell Crew Again Wins Mackay Trophy

A B-58 crew from Carswell AFB's 43rd Bomb Wing has been awarded the Mackay Trophy for the second consecutive year.

The crew of Maj. Robert G. Sowers, pilot; Capt. Robert MacDonald, navigator; and Capt. John T. Walton, DSO, won the coveted aviation award for their record-breaking, round-trip flight from Los Angeles to New York March 5, 1962.

Mackay trophy is annually awarded for the "most meritorious flight achievement" of the year, and is customarily presented by the Air Force chief of staff.

General Curtis LeMay presented the 1961 trophy to the B-58 crew of Lt. Col. W. R. Payne, pilot; Maj. W. L. Polhemus, navigator, and Maj. R. R. Wagener, DSO, for their historic New York-to-Paris flight in under 3 hours, 20 minutes.

Major Sowers' crew established three records during their round-trip dash across the continent:

West-to-east, 2 hours, 1½

minutes, with average speed of over 1,212 mph; east-to-west, 2 hours, 15 minutes, averaging over 1,091 mph; round trip, 4 hours, 42 minutes, averaging 1,044 mph.

Included in the round-trip time, though not reflected in either of the coast-to-coast times, is a 25-minute refueling stint over the Atlantic before the second leg of the dash.

Major Sowers and his crew were presented Distinguished Flying Crosses for the flight by Gen. Thomas S. Power, chief of SAC. The crew also received the Bendix Trophy for the same speed dash in ceremonies in Washington, D. C., April 26, 1962.

Established in 1911 by the late Clarence H. Mackay, an early air pioneer, the trophy was deeded to the National Aeronautic Association after his death.

Previous winners have included such aviation notables as Henry H. Arnold, E. V. Rickenbacker, B. D. Foulois, James H. Doolittle, Charles E. Yeager, Fred J. Ascani and others.

White to Head Newly Organized Cost Accounting, Research Dept.

R. P. White, estimating group supervisor, has been named by President Frank W. Davis to

head up the division's newly formed cost accounting and research department.

Designated Dept. 21, the new unit consists of cost accounting functions transferred from accounting (Dept. 9), and a new cost research activity, consisting of:

Dept. 21-1, cost records and reports; 21-2, material accounting; 21-3, labor accounting; and 21-4, cost research.

At the same time, general accounting (Dept. 9), has been reorganized into: 9-1, financial accounting; 9-2, accounts payable; 9-3, revenue accounting; and 9-4, payroll. The organization remains under R. W. Harwell.

"Reorganization of accounting and cost functions at this time recognizes changed requirements injected by the F-111 program," Davis said. "It will provide or-

ganizations to specialize in two general areas of operation having different goals and responsibilities.

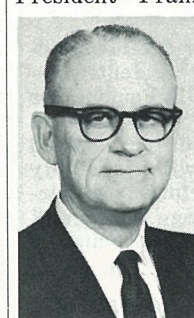
"General accounting realignment is to provide increased emphasis on cash management and other financial problems inherent with fixed-price contracts."

Davis added that realignment of cost functions and creation of a cost research section will provide needed financial data in meaningful form in a central location, and facilitate internal cost controls, estimating, forecasting and negotiations.

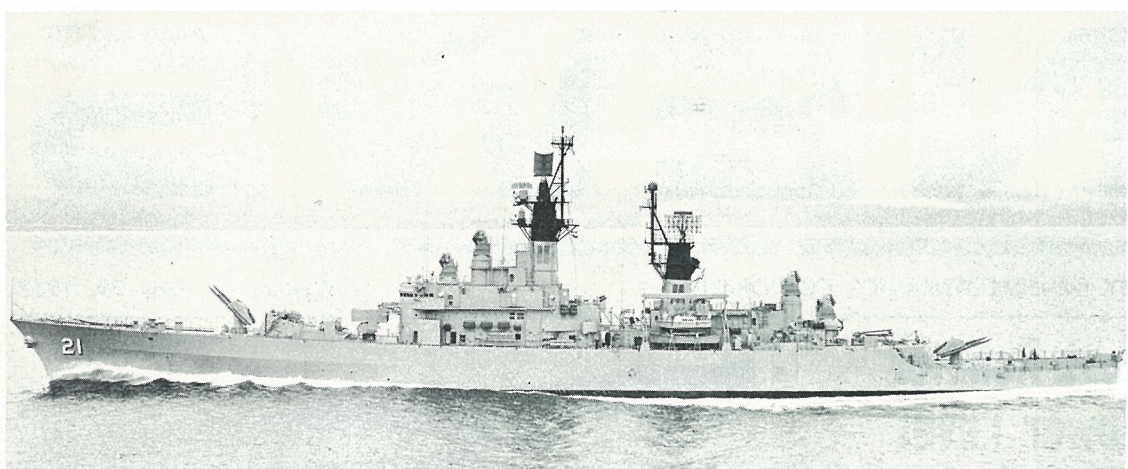
White joined GD/Fort Worth in 1954 as a systems accountant in cost control systems development. He assumed his current position as estimating group supervisor in 1957.

Previously, White served three years as budget manager for Whirlpool Corp. in La Porte, Ind., and as a senior industrial engineer for about 10 years with Glenn L. Martin Co.

He attended the University of Nebraska and Johns Hopkins University and has completed numerous other special management courses.



R. P. White



NAVY'S NEWEST — USS Gridley (DLG-21), armed with GD/Pomona-built Advanced Terrier missiles fore and aft, is shown during sea trials. C. D. Perrine Jr., executive vice president, represented company at commissioning ceremonies Saturday (May 25) at Puget Sound Naval Shipyard, Bremerton, Wash.

DYNAMICS RECEIVES SILVER MEDALLION AS AVIATION GIANT

General Dynamics was among 40 giants of the aviation industry to receive silver medallions from Aviation Space Writers Association for having served the industry for over 25 years.

Frank W. Davis, GD/Fort Worth president, accepted the award on behalf of Roger Lewis, Dynamics' president, at a banquet May 21 at Adolphus Hotel in Dallas.

The nostalgic tribute to aerospace included a slide collection showing aircraft manufactured in 1938, the year AWA was established.

Columnist Bob Considine was master of ceremonies at the banquet.

GD/Pomona's Sinks Addresses Institute

G. H. Sinks Jr., General Dynamics/Pomona manager of employment, spoke April 26 at a spring institute of International Association of Personnel in Employment Security held in Pomona. The institute was co-sponsored by University of California at Los Angeles.

Theme of the two-day institute, attended by 400 persons from 60 state employment offices in Southern California, was "Place of Employment Services in the Community." Included in discussions were representatives of labor, industry and education.

Dynamics Exhibit Sent To Paris For Air Show

General Dynamics products will have a prominent place next week when the 25th Paris International Air Show opens (June 7-16) at Le Bourget airport.

Demonstrations of swing-tail cargo loading using a Canadair-built CL-44 turboprop transport will be a feature. Another Canadair airplane, the CL-41R advanced systems trainer, will be on display and GD/Convair-built F-106s also are scheduled to take part.

Among exhibits will be one from GD/Pomona, marking that division's first participation in the show.

Both Tartar and Mauler will be featured. A booth, with 30-foot front, will occupy an area covering 60 square meters in the missile section of the show.

Shown will be a Tartar display

Newest Navy Warship Named For 'Fire When Ready' Gridley

The guided missile frigate Gridley (DLG-21), third ship of the fleet to be named in honor of Capt. Charles V. Gridley, USN, was commissioned Saturday (May 25) at the Puget Sound Naval Shipyard in Bremerton, Wash.

The Gridley is the 14th Advanced Terrier-armed frigate to be commissioned. General Dynamics/Pomona-built Advanced Terrier missiles also arm six cruisers and two carriers.

GD/Pomona was represented at the commissioning ceremony by C. D. Perrine Jr., executive vice president. Perrine, on behalf of the company, presented the ship with a set of ceremonial quarterdeck stanchions, modeled after the Advanced Terrier missile.

Captain Gridley, for whom the ship is named, distinguished himself "beyond all praise" during the Battle of Mobile Bay on Aug. 5, 1864, shortly after his graduation from the Naval Academy. Serving on board the steam sloop-of-war Oneida off Mobile, Ala., he had charge of the master's division and assisted in conning the ship from the topgallant fore-castle during the battle.

However, Captain Gridley was to gain everlasting renown later at Manila Bay as commanding officer of the protected cruiser Olympia, flagship of Asiatic Squadron. Adm. George Dewey's squadron stole past the batteries on Corregidor and arrived off Manila Bay near daybreak on May 1, 1898.

Admiral Dewey in his autobiography recounts: "At 5:40 when we were within a distance of 5,000 yards, I turned to Captain Gridley and said, 'You may fire when you are ready, Gridley.'"

Captain Gridley personally conducted the gunfire throughout the battle which ended in destruction of Spain's Philippine Fleet. He was on his way home when he died at Kobe, Japan, June 5, 1898.

GD/E Exhibits S-C Printer

General Dynamics/Electronics-San Diego demonstrated its S-C 3070 Electronic Printer at the Spring Joint Computer Conference in Detroit, Mich., last week.

The S-C 3070, designed for office, communications, or computer centers, is capable of printing a character at a time at speeds up to 5,000 words per minute.

Utilizing an electrostatic process, the non-impact printer produces legible permanent copy which can be used as a litho master to produce multiple copies for office distribution. The printer operates on-line or off-line with digital computer systems and is compatible with most available data transmission terminals.

Representing GD/Electronics at the May 21-23 conference were N. E. Frawley, industrial requirements assistant manager; D. O. Brending and H. G. Cooper, requirements representative; S. R. Viejo of requirements research; J. H. Gurley, manager Army requirements; Ron McClure, senior field service representative; Payne Johnson, manager of communication, and Helen Wood of communication.

Manual Published By Convair Editor

"Programmed Instruction — Training Manual" has just been published by J. D. Meacham, GD/Convair publications editor, after more than a year of research.

The manual is pointed directly to the "workers" in the field, such as instructors, programmers, editors, training directors, technical writers.

The 230-page loose-leaf book was printed in GD/Convair graphic reproduction and is available from J. Ravin Publications, 4215 Calavo Dr., La Mesa, Calif.

Ex-Patrol Boat Serves In GD/Astro Research

Sound and the sea are subjects of continuing research carried on by General Dynamics/Astronautics in Southern California coastal waters.

Heart of the research effort is "Rorqual," an 83-foot floating laboratory, originally a World War II Coast Guard patrol boat, later converted for use as a private yacht.

After its acquisition by GD/Astro, the boat was fitted with specialized electronic equipment (in addition to extensive navigational and communication gear, radar and depth sounder already on board).

Research utilizing Rorqual is aimed at acquiring data on transmission of oceanographic problems associated with underwater communication. Studies are related to work on advanced missile system programs now under way at GD/Astro under Project Engineer Kerry E. Coughlin, Dept. 580-4.

A small boat, carried aboard Rorqual, is launched to serve as a platform and recording station for communication equipment which is lowered into the sea for tests at various depths under varied conditions. At the same time, associated equipment is lowered from Rorqual.

Rorqual is "home ported" at GD/Convair's ramp facility on San Diego Bay, and when under

way is commanded by Coughlin or by Dr. C. G. McIlwraith, in charge of communication studies. R. E. Johnson normally handles electronic operations aboard ship.

Wynne Bowen serves as "chief of the boat"; Stan Hoyer is engineer; and G. R. Cooke and W. W. Bacon Jr., round out the crew.

Rorqual's operations are directly supported by a shore-based electronics lab housed in a van at the ramp facility. Here, equipment is calibrated and repaired, and new test devices are constructed to meet growing program requirements.

Leon Resnick handles these related operations ashore, while Ben Swett serves as design engineer for special devices used aboard Rorqual.

George Brolaski, project operations manager, arranges for production of much of this specialized equipment in GD/Astro's main plant tooling department.

In the past, Rorqual has gone to sea for less than 24 hours at a time, although research operations of up to four days' duration and ranging from Dana Point southward to the international border are planned for the near future.

The boat is capable of sustained operations up to 2,000 miles round-trip with a crew of 10 on board.



ASTRO SAILORS — William Bacon and Wynne Bowen, members of Rorqual crew, are in foreground, as GD/Astro's oceanographic research vessel lies off seaplane ramp facility on San Diego Bay.

New Centaur Lighter Seen To Carry Heavier Payloads

Ozone difluoride, a substance whose maximum production is now one-third ounce per hour, is under study as a mixture with liquid oxygen to ignite such high-energy space vehicles as General Dynamics/Astronautics' Centaur.

Centaur employs an electrical ignition system because its propellants, liquid hydrogen and liquid oxygen will not ignite on contact.

National Aeronautics and Space Administration's Lewis Research Center which guides the Centaur program has issued a contract for further study on mixing liquid oxygen with ozone difluoride. Preliminary tests show that a tiny quantity of the latter will cause liquid oxygen to ignite immediately on contacting liquid hydrogen. Extensive testing of this phenomenon is currently in progress.

(At General Dynamics/Astronautics technicians in the propulsion systems design group of engineering are looking into this field along with others related to high-energy propulsion.)

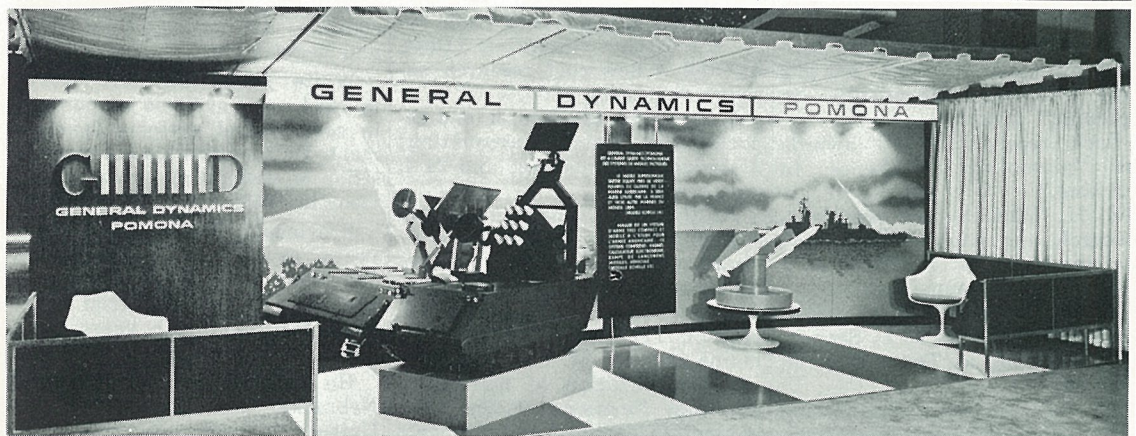
Lewis Center's Donald L. Nored summarized work with ozone difluoride and its potential with that of hydrogen/oxygen.

He said that, using the Atlas-Centaur rocket vehicle as a boost-

er, fluorine oxidizer in an upper-stage solar probe could carry a 25 per cent heavier payload than the oxidizer could manage. The payload capacity of a Mars orbit mission would be similarly increased with vehicles using fluorine.

Astro Chief Counsel On National Panel

H. Cushman Dow, GD/Astronautics chief counsel, has been named to the national panel, American Arbitration Association.



DYNAMIC DISPLAY — This GD/Pomona exhibit will be on display in Paris next week, offering a capsule introduction to such products as Terrier, Tartar and Mauler.





ON THE ALERT—Day and night—24 hours a day—B-58 Hustlers of 305th Bomb Wing at Bunker Hill AFB, Peru, Ind., are ready to go—if needed. A typical crew, Capt. D. M. Nomura, DSO; Thomas B. Adams, pilot and crew commander; William L. Stevenson, navigator, (lower left), rehearse flight plan, study targets. Center below, they dine with Lt. Col. Frederick L. Belfay, alert facility commander,

and at lower right they relax during alert duty. Top center is Col. Frank L. O'Brien, 305th commander, who flew first Hustler to Bunker Hill. At left above, Col. O'Brien confers with Col. Ned I. Colia, 305th director of maintenance, key figure in keeping B-58s on combat schedule. 305th crews average 74 hours a week on job, flying practice missions when not on alert duty.

B-58s of 305th Wing Pass Grueling War-Ready Test

(B-58 Hustlers, built by General Dynamics/Fort Worth, are on active duty for SAC in two wings, the 43rd Bomb Wing stationed at Carswell AFB, Fort Worth, and the 305th at Bunker Hill AFB, Peru, Ind. Following is an account of how GD/FW aircraft at Bunker Hill are serving.)

Bunker Hill AFB was alive night and day recently with the whining of jet engines in maintenance and the thundering roar of B-58s and jet tankers taking off on repeated "combat" missions.

With devastating accuracy, crack Hustler crews of the 305th Bomb Wing electronically blasted "street signs" and "corners of buildings" representing top-priority "enemy" targets.

At the end of seven grueling days of activity—in reality an "examination of all phases of operations with the B-58 weapons system"—Maj. Gen. S. W. Wells and 30 specialists from SAC's Inspector General handed down the verdict: the 305th is "combat ready."

The nation's second B-58 wing thus became the first Hustler unit to pass SAC's Operation Readiness Inspection Test (ORIT). This is an exacting week-long spot check which proves that men and machines of the 305th can "react to wartime conditions on a moment's notice."

"Everything went like clockwork," said Col. Frank L. O'Brien, 305th commander. "Our men performed like seasoned veterans, and the Hustler proved beyond doubt that it can really do the job."

Col. O'Brien was on hand all but nine hours of the test, ex-

horting his troops with what one aide called "Fightin' Irish fervor."

Two weeks later the big, ruggedly handsome commander had caught up on his sleep, but not the 12 pounds he lost during the ordeal!

Thus the historic "Can Do" Wing, one of the newest supersonic additions to the nation's retaliatory force, passed SAC's most stringent combat-readiness test with flying colors.

"It's a real tough one too," one veteran observed. "Older outfits have, on occasion, flunked it unashamedly."

But even as men of the 305th were passing this milestone, roughly 50 per cent of the wing's force—as in all SAC bomber units—was cocked and ready to fire a lethal nuclear shot at the heartland of any aggressor.

These are the alert crews. They are isolated in a zealously guarded facility on base, where they eat, sleep, study, play and, if necessary, go to war. They are never more than a few minutes from being airborne at any time.

When the klaxon sounds, they drop what they're doing and charge up emergency ramps. Fast-drive vehicles whisk them to waiting B-58s in seconds.

"The planes are ready," said Capt. Thomas B. Adams of Mil-

brook, N. Y., a B-58 commander. "Practically all we have to do is push the starter."

An "all clear" will often bring an abrupt halt to the roaring symphony played by scores of jet engines. But on other occasions, the noise will only soften as the Hustlers file out one behind the other to the end of the runway.

"Sure, we're nervous when the alert moves this far," said Captain Adams, "because if we ever have to drop a bomb our mission—peace—has failed."

"Getting the bombers airborne does not necessarily send SAC to war," Col. O'Brien pointed out as a reminder that "recall capability" is still a "unique virtue" of the manned bomber.

"After reaching certain positions on their routes, well outside enemy territory, these bombers automatically return to base unless they receive positive coded instructions to proceed to target. SAC calls it positive control."

But should the dreaded "real thing" come along, professionals of the 305th are undoubtedly ready for the job.

"I figure I know our target better than I know my own home town," said Capt. William L. Stevenson from the state of Washington, navigator on Captain Adams' crew.

Third member and DSO of the crew is Capt. D. M. Nomura, of Honolulu, Hawaii. Having trained together a year, the crew figures it is "highly coordinated."

On the whole, this crew is a little younger (average age 29) than the average SAC crew (34 years old, with 19.5 combat missions), but in other respects they're typical.

Two own college degrees and the third is completing requirements for his sheepskin. All are devoted family men. And all are typical of the mentally keen, well-conditioned, dedicated pros who provide this country's first "human" line of defense.

Forty-hour week? It's a civilian cliché to these modern-day minutemen, who average 74 hours a week on the job. When they're not on alert duty, they're routinely flying practice missions.

Airmen on alert are briefed daily on weather, targets and oth-

LeMay Was Wartime Commander of 305th

The 305th Bomb Wing, that flies GD/Fort Worth-built B-58s from Bunker Hill AFB, Ind., is no Johnny-come-lately.

The unit "seemed destined for greatness from the time it reached England, Oct. 27, 1942," an AF veteran recalled. First taste of battle came Nov. 17, when a cigar-smoking commander, then Lt. Col. Curtis E. LeMay, led his "heavies" in a sortie on enemy submarine pens. There was more and more of the same in the years that followed, climaxed by a strike on a rainy day in 1944 when the 305th led the entire Eighth Air Force to targets deep inside Germany, earning a unit citation, one of many honors.

The Wing's motto is "Can Do." To which jet age jocks have added "At Mach 2."

er timely subjects. They get intensive training on their mission and their B-58, the most sophisticated bomber in the nation's arsenal.

Despite living under constant pressure of the "real thing," 305th alert crews carry on in otherwise routine fashion in the alert facility, named the "Bunker Hilton." The facility has what must surely be the country's only "Duncan Hines" approved Air Force eatery!

U.S. BOND BUYING RAISED TO 63 PCT.

Over 6,600 employees — about 63 per cent of the GD/Fort Worth population — now buy U. S. Savings bonds. Average weekly deduction is \$15.05.

These facts were released following the annual Bond Drive May 6-10.

Nearly 58 per cent of employees were participating in the bond payroll deduction plan when the drive was launched. Some 643 new buyers were added during the drive.

Employees who did not get a chance to sign up during the drive were contacted by supervisors.

Jackson Decorated For Work on B-58

Harold Jackson, Dept. 268-1, recently received the Air Force Commendation Medal for "outstanding service" during a period from 1958 to 1963.

As a staff member of headquarters, 19th Air Division, Jackson had a hand in phasing the B-58 Hustler into the SAC inventory.

Jackson retired from the Air Force with the rank of SMS after serving from 1939 until this year.

SAC B-58s Tightly Controlled to Make 'Accidental Attack' an Impossibility

A foolproof system called "Positive Control" prevents SAC bombers from starting an "accidental war."

Should an attack on this country appear imminent, SAC will order its bomber force into the air.

They will proceed to pre-determined points, some distance from enemy targets. Unless they receive positive coded voice instructions to proceed to their targets, the bombers automatically return to base.

"The 'go code,' sent only up-

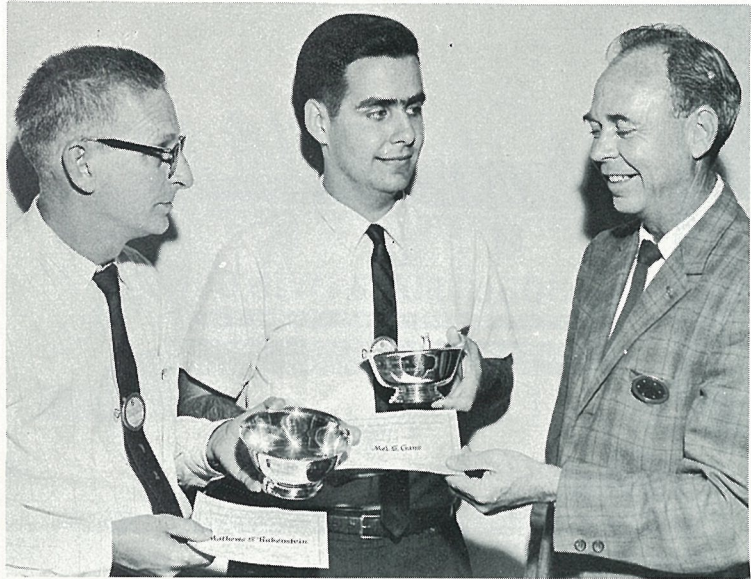
on order of the President, would be authorized at several levels of command and ultimately by more than one member of the bomber crew," SAC says.

Use of dispersed transmitters and different methods of communications eliminates the possibility that the "go code" might not be received by the aircraft.

In a current fiction best-seller, U. S. bombers mistakenly attack an enemy target. Such action is virtually impossible under Positive Control.



"I still say . . . it looks just like tomato juice!"



WINNERS—Commissioner Bill Culbertson presents Matthew S. Rubenstein, left, and Mel S. Gans with first-place honors gained in recent Region Six NIRA Bridge Tournament.

Gans, Rubenstein Capture "Firsts" In NIRA Contract Bridge Tourney

Placing first with high east-west pair in Region Six Division of the recent first National Industrial Recreation Association Contract Bridge Tournament were Mel S. Gans, Dept. 260 and Matthew S. Rubenstein, Dept. 260.

Second place winners with high north-south pair were A. J. D'Ascenzo, Dept. 65 and Henry Weltman, Dept. 65.

Gans and Rubenstein each received a Certificate of Merit, an engraved silver bowl trophy, and a Samsonite card table and four matching folding chairs.

D'Ascenzo and Weltman received an engraved silver plated trophy.

Member companies of NIRA participated in the par event, playing identical hands on the

same date. Almost 2,000 players in the United States and Canada participated.

Carlberg and Fisher Get Bowling Offices

Harry Carlberg, GD/FWRA Bowling Commissioner, and Ray Fisher, secretary of Management Club Bowling League, have been elected to the Board of Directors of the Fort Worth ABC Bowling Association to serve for two years.

Bowlers who wish to bowl in a new establishment at very reasonable cost are asked to contact Carlberg, ext. 2818 or Fisher, ext. 3907, for further details.

Dy-Gen

Mgt. Club JA Company Wins Major Award

Top Junior Achievement Company and Industry Award for overall outstanding accomplishments was presented to the Dy-Gen Company, sponsored by General Dynamics/Fort Worth Management Club.

Dy-Gen was awarded the large revolving trophy at the recent annual Tarrant County Junior Achievement Banquet held at Ridglea Country Club. In addition, each member received an individual trophy cup.

Special adviser award also went to advisers of Dy-Gen. This award was sponsored for the first time this year by the National Management Association and the GD/FW Management Club to be given to the company receiving the Industry Award. Individual plaques were awarded to Ted Yaggi, Dept. 8; Ray Jones, Dept. 4; Frank Metcalf, Dept. 30; and Gary Harris, Dept. 16.

A crowd of 698 people was present for the academy-award style presentations. Principal speaker was W. T. Gillingham, president of Schlumberger, Houston.

Gary Maxwell, son of W. Maxwell, Dept. 24-9, a Dynamco member, and Rick Rogers, son of M. W. Rogers, Dept. 260 and Ruth Rogers, Dept. 65, both won a trip to the National Junior Achievement Conference to be held at Indiana University in August. Rogers was a member of Rako, a Continental Oil sponsored company.

Sharon Smith, of Dy-Gen was appointed as an alternate to the National Conference.

GD/FW Management Club presented B-58 cuff link sets to the top boy and B-58 charm disks to the top girl of each of the three companies.

Blake Bailey Jr. and Sharon Smith were top achievers of the Dy-Gen Company. Jemco honors went to Carolyn Travers and Edwin L. Archie, and Dynamco top achievers were Sharon Newman and Alan Sevadjan.

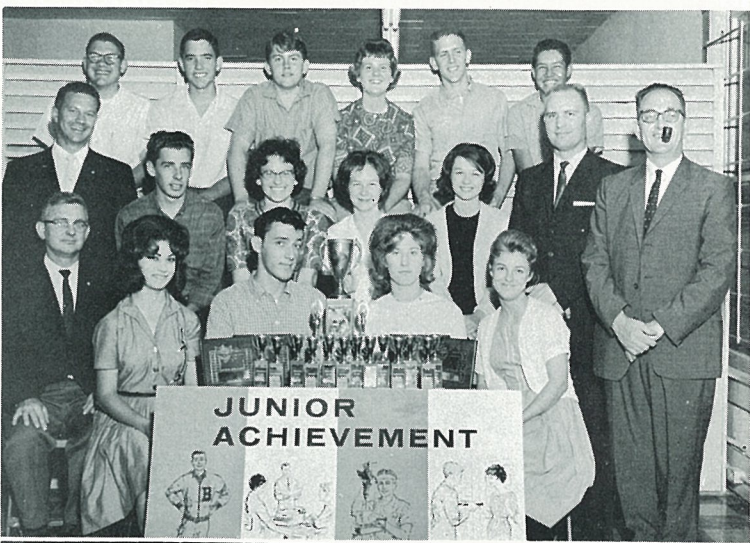
Dy-Gen made and sold Christmas candles, ceramic trivets, and natural stone paper weights. Total sales for the year were \$704.26.

Dynamco products were redwood and ceramic planter boxes. Advisers were Norm Kuhn, Dept. 9, chief; Henry Barbolla, Dept. 10, business; Blake Bailey, Dept. 28, production; and C. E. Allen, Dept. 14, sales.

Jemco Company made and sold jewelry and lamps. Advisers were E. E. James, Dept. 65-2, chief; Dub Bryant, Dept. 25, sales; Willard Gibbons, Dept. 19-1, business; and Charles Rosenau, Dept. 28, production.

The Junior Achievement program is nationwide with centers in cities and communities throughout the U. S. Tarrant County had a total of 34 companies this year.

M. J. Scott, Dept. 8, is vice president-facilities, and Yaggi is chairman of the GD/FW Management Club Junior Achievement Committee.



When You're In Junior Achievement You're In Business



ACHIEVERS—Members and advisers of Management Club's Dy-Gen Co., above, won top Junior Achievement Company and Industry Award this year. Below, Rick Rogers, left, son of M. W. Rogers, 260, and Ruth Rogers, 65, and Gary Maxwell, son of W. Maxwell, 24-9, won trip to National JA Conference at Indiana University in August.

June 15 Employees' Deadline for Getting Casa Manana Tickets at 23% Discount

Employees may purchase certain tickets to Casa Manana's slate of summer musicals at 23 per cent discount under a plan announced by GD/FWRA.

Regular \$3.25 tickets may be obtained for \$2.50 by presenting the coupon below at the Casa box office. Similar coupons are also available at the Club House in the Recreation Area.

Tickets must be purchased by June 15. After that date, the discount rate will not apply.

Any number of tickets may be purchased under this plan. The tickets are good for any performance, except those on Friday or Saturday evenings.

Shows and dates are: "Song of Norway," June 3-15; "Gypsy,"

June 17-29; "Cinderella," July 1-6; "Wildcat," July 8-20; "The Vagabond King," July 22-Aug. 3; "Carnival," Aug. 5-17; "Naughty Marietta," Aug. 19-31; "West Side Story," Sept. 2-14.

Winners Named In Plane Contest

Winners of the recent model airplane free-flight contest held at Benbrook Lake were: Nordic glider event, Stuart Lee (first), Mike Reeves (second), and Faust Parker, (third).

The combined gas event was won by, Walt Reeves (first), Mike Reeves (second), and Steve Parker (third).

Log Book Entries

Promotions

Promotions to and within supervision, professional and administrative effective May 6:

Dept. 4: to material control assistant supervisor, H. A. Morrow; to production change analyst, J. H. Ware.
Dept. 8: to project industrial engineer, Q. R. Creasy; Dept. 19: to electronic data processing programmer sr., R. D. Marshall.

Dept. 60: to design engineer senior, D. Wilkerson; Dept. 62: to aerosystems engineer senior, T. G. Cheatum; to flight test engineer senior, D. J. Brooks, J. D. Hedges, E. E. Lattier Jr.

Dept. 63: to aerodynamics engineer senior, S. W. Wilson Jr.; to engineering planner senior, J. F. Seat.

Dept. 88: to cost estimator, A. J. Foster; Dept. 160: to design engineer, T. A. Kivikko; Dept. 181: to contract analyst A. C. E. Jackson; Dept. 260: to aerosystems engineer senior, B. G. Kouri.

Awards

The following received Employee Suggestion awards totaling \$322.20 for the period ending May 14:

Dept. 23-1, W. M. Payne; Dept. 25-3, W. E. Ramm; Dept. 27-1, T. E. Powers; Dept. 65-4, B. D. Blanton, L. W. Patterson.

Dept. 75, R. H. Hay, T. H. Stribling; Dept. 81, J. C. Keller.

Retirements

DECKER—C. C., Dept. 33. Seniority date Feb. 10, 1949 (FW), retirement effective April 14. Rt. 1, Box 324, Burleson, Texas.

SELL—E. M., Dept. 75. Seniority date Oct. 14, 1947 (FW), retirement effective May 31. 705 Kimbrough, Fort Worth 8, Texas.

WOOD—W. O., Dept. 81. Seniority date April 15, 1942 (FW), retirement effective May 31. 4711 Byers, Fort Worth, Texas.

Deaths

MOORE—H. H., Dept. 36, died May 12. Survivors include his wife and four sisters.

SALTER—Rex, Dept. 25-3, died May 9. His wife survives.

TROTTER—W. F., Dept. 29-1, died May 16. Survivors include his wife and one niece.

Personals

I would like to express my deepest appreciation to my many friends at GD/FW, especially those in Depts. 9 and 19, for the wonderful gift. I have never before met such wonderful people to work with. I will always remember each of you.
Jo Anna Craig

I would like to express my heartfelt thanks to all the friends at GD/FW for the floral offerings and other expressions of sympathy upon the recent death of Harvey Moore.
Mrs. Harvey H. Moore

I would like to express my thanks to my many friends for the beautiful floral offerings and for their kind words and prayers during the illness and death of my beloved husband.
Mrs. Rex Salter

We would like to thank our many friends at General Dynamics/Fort Worth for the lovely floral offerings and other expressions of sympathy upon the recent death of our loved one.
The Family of James Arthur Powell

Hitchhikers

Ride Wanted From

1236 W. Bewick (South Side), 7:45 a.m. shift, call D. C. Phillips, WA 4-0203.

Riders Wanted From

Between Trail Lake and South Dr. (Westcliff), 7:45 a.m. shift, call J. Fickensworth, WA 3-4133.

Haltom City area, 7:45 a.m. shift, call Ray Bryan, TE 8-8959.
River Oaks, 7 a.m. shift (Lot 1), call PE 8-0430.

Car Pools

MEMBERS WANTED — from South Hills, 7:45 a.m. shift, (lot 3), call Walter Stecker Jr., WA 3-8348.

MEMBERSHIP WANTED — from 1501 Stafford Dr. (Highland Hills-Viewpark area), 8 a.m. shift, call Janis Ellert, WA 6-3744.

MEMBERSHIP WANTED—from 2001 Dorothy Lane (Arlington Heights), 8 a.m. shift, call Leonard Parker, PE 8-1727.

General Dynamics NEWS

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NO. 1—Gary Canada, son of Mrs. George Canada, Dept. 35, receives FW National Bank Trophy as top first-year ROTC cadet in city.

Activities Calendar . . .

General Dynamics/Fort Worth Recreation Association events in the next two weeks are listed below. Readers interested may clip this column and save it for reference until next issue of General Dynamics News. For more information, phone GD/FWRA office, ext. 2771.

Tonight, May 29

TABLE TENNIS: play, 6-11 p.m., GD/FWRA Fieldhouse.

Thursday, May 30

ART: class, 7-10 p.m., GD/FWRA Council Room.

RADIO: meeting, 7:30 p.m., GD/FWRA Radio Room.

SQUARE DANCING: classes: beginner, 7 p.m.; advanced, 8:15 p.m., GD/FWRA.

VOLLEYBALL: play, 6:30 p.m., GD/FWRA Fieldhouse.

Friday, May 31

ART: class, 9:30 a.m., GD/FWRA Council Room.

BRIDGE: duplicate session, 7:45 p.m., GD/FWRA Clubhouse.

Sunday, June 2

FENCING: 7-10 p.m., GD/FWRA Fieldhouse.

TABLE TENNIS: play, 1:30 p.m., GD/FWRA Fieldhouse.

Monday, June 3

MOVIE: "Herod the Great" (color), with Edmond Purdom. Shown lunch period, 50-foot aisle.

Tuesday, June 4

FENCING: 7-10 p.m., GD/FWRA Fieldhouse.

STAMP CLUB: meeting, 7:30 p.m., GD/FWRA.

Wednesday, June 5

BRIDGE: duplicate session, 9:30 a.m., GD/FWRA Clubhouse.

CHESS: meeting, 7:30 p.m., GD/FWRA Council Room.

TABLE TENNIS: play, 6-11 p.m., GD/FWRA Fieldhouse.

Thursday, June 6

ART: class, 7-10 p.m., GD/FWRA Council Room.

RADIO: meeting, 7:30 p.m., GD/FWRA Radio Room.

SENIOR CITIZENS: meeting, 1 p.m., GD/FWRA Clubhouse.

SQUARE DANCING: classes, beginners, 7 p.m.; advanced, 8:15 p.m., GD/FWRA.

VOLLEYBALL: play, 6:30 p.m., GD/FWRA Fieldhouse.

Friday, June 7

ART: class, 9:30 a.m., GD/FWRA Council Room.

BRIDGE: beginners class, 6:30 p.m.; play, 7:45 p.m., GD/FWRA Clubhouse.

Sunday, June 9

FENCING: 7-10 p.m., GD/FWRA Fieldhouse.

TABLE TENNIS: play, 1:30 p.m., GD/FWRA Fieldhouse.

Monday, June 10

MOVIE: "The Champion," with Kirk Douglas. Shown lunch period, 50-foot aisle.

Tuesday, June 11

COIN CLUB: meeting, 8 p.m., GD/FWRA.

FENCING: 7-10 p.m., GD/FWRA Fieldhouse.

ROCKHOUNDS: meeting, 7:45 p.m., GD/FWRA Council Room.

Wednesday, June 12

BRIDGE: duplicate session, 9:30 a.m., GD/FWRA Clubhouse.

Recreation AND SPORTS



PACE-SETTERS—Giants and Indians jumped out to early lead in GD/FWRA Junior Baseball League Play.

Unbeaten Giants, Indians Grab Early Lead in Junior Baseball

The Giants and Indians emerged unbeaten and atop the heap following the first week of play in GD/FWRA Junior baseball.

Manager Tom Busby's Indians blasted the Pirates 14-2, Panthers 14-3, and Eagles 6-3 to gain the upper hand in the Freshman League (ages 10 through 12).

Meanwhile the Giants, guided by C. S. Gotcher, edged the Bobcats 8-7 and the Yankees 7-5 during the week to gain top spot in the Minor League (8 and 9 year olds).

Minor League play will be on Wednesday and Friday nights at the Recreation Area, while Freshman Leagues will square off Tuesday and Thursday nights. Play continues through July 19.

The five teams in the Sophomore League will begin play June 4.

Shown above (top photo) is the front-running Giant squad: Back row, from left: Manager Chester Gotcher, Steve Robertson, Gregg Garner, John Harris, Henry Dawson, Bobby Simonson, Mike Harvey, Mark Young, Floyd Brooks, and Assistant Manager C. D. Simonson.

Front row: Bill McCarty, Doug Nabors, Bobby Landwermyer, Eddie Guinnup, Paul Brooks, David Gotcher, and Larry Fuller. Not pictured is Bryan Peck.

Indians, back row, from left: Manager Tom Busby, David Gandy, Mike Busby, Greg Miller, Butch Orr, James Letteer, Gary Stepp, Randy Goins, Sheldon Simpson and Assistant Manager Cecil Stepp.

Front row: Randal Simpson, Bobby Roe, Gordon Richey, Larry

Radio Club Plans Meet for June 2

A special meeting of GD/FWRA Radio Club is planned for 2 p.m. June 2 at the Clubhouse.

Primary purpose of this meeting is to elect club officers, according to Commissioner Keith Pugh.

The annual ARRL Field Day is set for June 22 and 23. This contest is to determine the operating capability of the club under simulated emergency conditions.

All club members are urged to participate in the contest, and all GD/FW employees and their families are invited to visit the Field Day site during the contest to see the club in action.

Further details will be published later along with time and site location.

Rightmer, Ernest Montgomery and Monty Montgomery.

LEAGUE STANDINGS		
Freshman League		
	Won	Lost
Indians	3	0
Eagles	2	1
Panthers	1	2
Pirates	0	2
Minor League		
	Won	Lost
Giants	2	0
Yankees	1	1
Mustangs	1	1
Bobcats	0	2

Magers Slates Europe Tour

A special two-week European tour has been arranged by GD/FWRA Travel Activity, announced Commissioner E. L. Magers.

A minimum of 77 people are required to make the trip. Tour cost is \$295 a person. Reservations must be made in the inplant recreation office by June 3.

The group is scheduled to leave Fort Worth Sept. 7 and return Sept. 22.

Highlights of the tour will be trips to London, Paris, Lyon, Milan, Venice, Innsbruck, Munich, Frankfurt, Cologne, and Amsterdam.

Further information regarding the European trip or other trips arranged by the GD/FWRA Travel Activity can be obtained by contacting the inplant recreation office, ext. 2771.

Men's Volleyball Team Is Second

GD/FWRA men's volleyball team took second in a recent all-day tournament held at Riverside Recreation Building.

"More girls, 14 and over, are still needed for our women's team," said Commissioner Andy D'Ascenzo.

"Fourteen girls, ages 11 to 13, were present for our first junior volleyball meeting," said D'Ascenzo. Junior volleyball classes will continue to meet every other Thursday throughout the summer. Next meeting is set for June 6 on the volleyball court in picnic area No. 1.

Regular volleyball play for men and women will be held each Thursday in the Fieldhouse.

Is It News?

Is it news? Then grab a telephone and call General Dynamics News.

'Hobby' Meet Set For Sr. Citizens

Next meeting of GD/FWRA Senior Citizens Club is scheduled at 1 p.m. June 6 at the Clubhouse.

"Plans have been discussed for a hobby show and exhibit in the near future," said Milt Stewart. All Club members interested in an exhibit of this type are asked to contact Stewart.

'Blithe Spirit' Cast Rehearses

Roles in "Blithe Spirit," Wing and Masque's last production of the season, have been cast and rehearsals are under way.

Dave Nibbelin and Barbara Rothacker will be seen as Charles and Ruth Condomine. The role of Elvira (blithe spirit) went to Gale King.

C. E. Hoffman and Billie Milam will portray Dr. and Mrs. Bradman. Theda Cobb will play the part of Madame Arcati and Carrie Brent will be Edith, the maid.

The upcoming Noel Coward farce will be Wing and Masque's 55th major production since "Arsonic and Old Lace" opened at the Pioneer Palace in 1951. The last Noel Coward play to be presented by Wing and Masque was "Nude with Violin," in the fall of 1959.

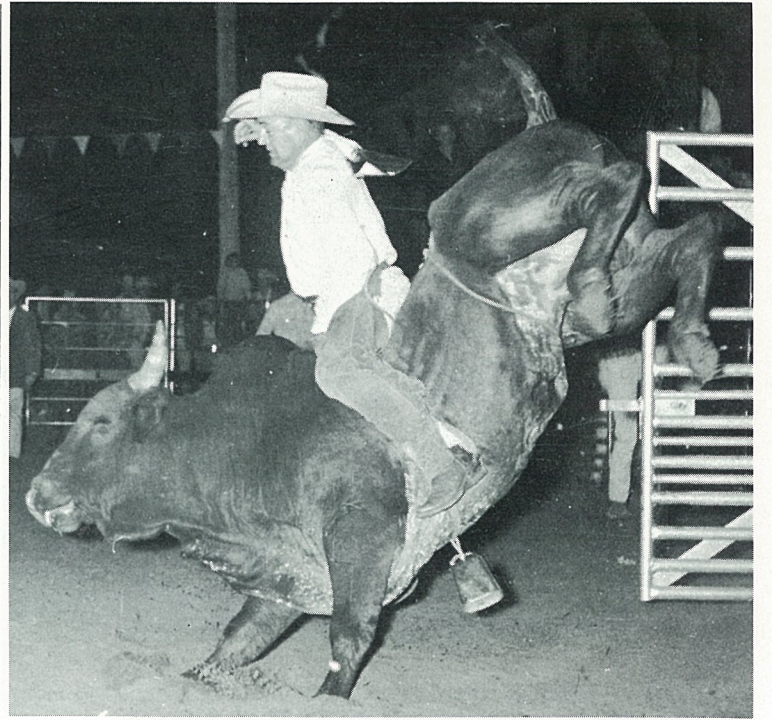
Other productions this season have been, "The Grass is Greener," a sophisticated drawing room comedy; "Love Rides the Rails," an old-fashioned melodrama; and "Don Juan in Hell," the 90-minute dream scene from George Bernard Shaw's "Man and Superman."

"Blithe Spirit," which will open June 21, is under direction of Mildred Deam.

Murray to Present Live Color Show

A special program and live demonstration of polaroid color ("pola-color") will be presented by photographer Aaron Murray at the next Camera Club meeting at 7:30 p.m. June 12 at the Clubhouse.

"Murray will shoot three rolls of film at the meeting," said Commissioner Miles Rogers.



LOTS OF BULL—T. M. Smith, 87-1, chairman of Ranch Rider's Annual Spring Rodeo slated for June 16, shows type of action to expect. Admission is free.

Top-Notch Contestants to Perform In Annual Spring Rodeo June 16

GD/FWRA's annual spring rodeo will be held at 3 p.m. June 16 at GD/FWRA Ranch Area.

Admission will be free, with "plenty of parking space and soft drinks and sandwiches available on the grounds," according to Commissioner Claude Schmidt.

Top-notch cowboys and cowgirls from GD/FW and surrounding areas will participate.

Events for female entrants in-

clude bareback riding, calf roping, steer wrestling, and barrel racing. GD/FW barrel racers and members of the Texas Barrel Racing Association will participate separately.

"Any person who wishes to ride in the grand entry is invited to do so," Schmidt said.

Special guests will include Cowtown Posse, Tarrant County Sheriff's Posse, and the Tip Top Riding Club. Special events will include the Calf Scramble for children six and under and 12 and under.

Jack Ratjen from Mansfield will produce this year's rodeo.

Classes in Tennis Start Next Week

Tennis classes for children (9 and over) and adults are scheduled to start next week.

Eight 30-minute lessons will be offered, with lessons scheduled every other week through Sept. 19.

Fee for classes is \$5 for the season. Instructor will be Warren McMillan, tennis pro at Rivercrest Country Club.

Those interested in registering for classes should contact E. T. Smith at ext. 3163 or AX 2-0181.

Chess Club Slates June 5 Meeting

Next regular meeting of the GD/FWRA Chess Activity is scheduled at 7:30 p.m. June 5 in the GD/FWRA Council Room, according to Commissioner E. W. Gomez.

Refreshments will be served.

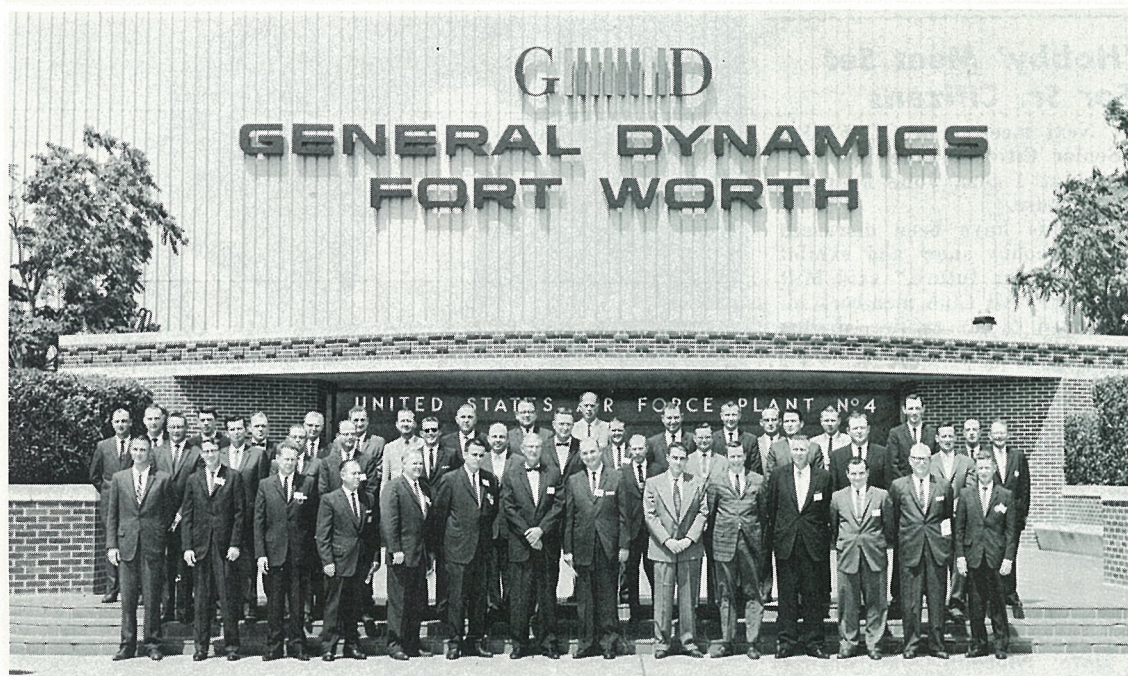
The Passing Years

The following emblems were due during the period June 1 through June 15.

Twenty-year: Dept. 4, M. M. Anderson, J. T. Y. Tyler; Dept. 9, F. B. Stebbins; Dept. 14, M. C. Walker.
 Dept. 20, J. A. Bradshaw Jr.; Dept. 22, L. G. Ivy, C. B. McCarthy; Dept. 23, D. C. Mason.
 Dept. 24, L. E. Evans, G. W. Griffiths, C. M. Nolden, O. B. Powell, J. A. Schild.
 Dept. 25, F. McNeary; Dept. 27, A. L. Buchanan; Dept. 29, J. S. Wood; Dept. 31, R. L. Frazier, M. Head Jr.
 Dept. 33, J. M. Roberts; Dept. 40, M. E. Burks; Dept. 41, J. B. Guyer, G. W. Lively.
 Dept. 50, R. A. Smith; Dept. 56, J. V. Gallaher, W. C. Harper; Dept. 60, J. C. Wilson.
 Dept. 65, T. H. Dunn; Dept. 73, R. H. Dunn; Dept. 74, J. A. Taylor; Dept. 75, W. R. Reese.
 Dept. 93, J. I. Coulter, J. Q. Newberry, F. F. Phillips; Dept. 95, S. E. Mills, B. R. Williams.
 Dept. 96, W. R. Arendall, M. Miller; Dept. 160, R. M. Ellis; Dept. 187, E. Kardaras.
 Dept. 263, J. E. Heil; Dept. 264, J. Spencer; Dept. 280, J. W. Beaver.
 Dept. 346, P. A. Clem, J. Farr, S. O. Hutchinson, J. A. Munn, W. F. Walker.
 Fifteen-year: Dept. 3, P. G. Beasley, C. E. Nevitt; Dept. 4, P. V. Wehant, A. J. Worlow.
 Dept. 7, L. R. Cox, J. W. Hatfield; Dept. 9, R. D. Sherrill Jr.; Dept. 19, L. W. Bradshaw.
 Dept. 24, C. E. Russell; Dept. 25, C. N. Mimitz Jr., U. S. Smith; Dept. 27, W. J. Dane, C. F. Holder.
 Dept. 30, W. L. Givens, J. T. McCree; Dept. 75, E. L. Richardson, T. L. Weems, P. C. Yarnell.
 Dept. 81, D. B. Corpany; Dept. 94, C. H. McMahon; Dept. 97, E. W. Meador, T. R. Reed, J. W. Williams.
 Dept. 105, T. D. Wakeley; Dept. 181, R. E. Neil; Dept. 182, D. D. Hatchett; Dept. 262, A. E. Peck.
 Dept. 268, G. A. Norton, K. L. Prohs, J. A. Raynor; Dept. 280, J. L. Arnold, E. L. McMurray.
 Ten-year: Dept. 9, H. R. Bean; Dept. 16, J. S. Levering; Dept. 17, D. E. Wall Jr.
 Dept. 25, R. A. Turk, J. E. Fickenwirth; Dept. 35, H. E. Atchison; Dept. 61, C. B. Moore, L. G. Worthington.
 Dept. 62, R. L. Hines, T. J. O'Connor, M. E. Herring; Dept. 63, D. G. Hammond; Dept. 64, E. L. Burkhard.
 Dept. 80, G. D. Moran; Dept. 96, M. O. Todd; Dept. 262, D. L. Brooks; Dept. 263, F. E. Beaty; Dept. 264, W. L. Gappa.



BOWLING'S BEST—"Rolloes," top photo, won B-58 League. From left: Melvin Scarr, Jack Kauffman, Wesley Stephenson, John Sharpe and Pete Mills. Bottom photo, the "Jim Dandies," winners of Guys and Gals League, from left: Esco Huber, Eddie Pair, Jim Brock and Pearl Brock.



GRADS — Ready to apply value engineering techniques to their daily functions are these graduates of Value Engineering Seminar No. 21 at GD/Fort Worth.

Mgt. Club Volunteers to Fence Parking Lots at Camp Leonard

GD/Fort Worth Management Club volunteers will spend four Saturdays in June constructing about 2,400 feet of low fence for parking lots at Camp Leonard.

Willard J. Johnson, 1963 project chairman, has stated that 75 to 100 men will be needed for the June 8 work session, which will involve preparing bases for rock columns and gathering rock.

A like number of volunteers will be needed on each of the following Saturdays: June 15, for pouring concrete bases and laying rock columns; and June 22, for finishing columns and setting

poles in place.

On June 29, 50 to 75 volunteers will be needed to perform clean-up activities.

"Cooperation of all members in this very worthwhile civic project will be appreciated," Johnson said.

Bruce McHarg is vice chairman of the '63 project, assisted by V. K. Reeser, engineering, and B. R. Main, transportation.

J. B. Dinsmore is permanent Longhorn Council Coordinator for the annual project.

Captains and their alternates for the work are W. D. Halsey and E. C. Johnson, June 8; H. L. Collins and G. W. Harrington, June 15; H. E. McMurtrey and H. T. Cain, June 22; and L. M. Mayfield and R. E. Davis, June 29.

GD Men Installed National Officers Of Writers Group

L. J. Solheid of GD/Convair and Charles W. Thelen of GD/Fort Worth were installed as national officers of the Society of Technical Writers and Publishers at the May 16-18 annual convention in Boston, Mass.

Solheid, service publications supervisor at GD/Convair, was seated as second vice president, and Thelen, GD/FW engineering publications supervisor, as treasurer for his second consecutive term. Before the recent election, Solheid had served as a national director of the Society since 1959.

At the San Diego Chapter level, the entire slate of officers will be filled by General Dynamics people for the coming term, starting in June.

Newly-elected chairman is E. S. Bill; vice chairman, Miles Gordon; treasurer, Walter E. Brees, all of GD/Astronautics publications quality assurance. Betty Valin, GD/Convair publications editor, is new recording secretary; and Bernice Lundquist, GD/Astro publications assistant, corresponding secretary.

Accountants Elect C. T. Barrett as VP

Charles T. Barrett, CPA and administrative accountant in Dept. 9-3, was elected vice president of Fort Worth Chapter, National Association of Accountants.

Outgoing president Bill V. Frey, internal auditor in Dept. 2-6, was elected director of chapter competition. Others re-elected were Lawson W. Cooper, accounting supervisor Dept. 9-1, secretary; and Sid Bobbitt, accounting supervisor Dept. 21-3, publicity director.

GD/FW Son Honored By American Legion

Thomas V. Nevitt, 15, son of Charles E. Nevitt Sr., Dept. 3-3, was recently awarded the American Legion Certificate of School Award for "honor, courage, leadership and service in advancing society and fundamentals of government."

He is an honor student at Richland Hills Junior High School.

Value Team Cuts Cost At Design Level

"Substantial savings" — including a potentially dramatic cost-cutting on a product at design level — were reported at GD/Fort Worth's 21st value engineering seminar April 29 to May 10.

The product is a B-58 food container capable of heating frozen or hermetically sealed food for crewmen in flight. Air Force requested GD/Fort Worth to design and manufacture the item.

"Significantly," said Rand Creasy, value control deputy coordinator, "engineering requested that one of our teams take a look at the container before the proposal was submitted to Air Force."

"The value team came up with a suggestion which, if followed, will effect a sizable savings. Engineering is taking another look now."

Forty-five people, including a Grumman employee and three men from Air Force Plant Representative's office, attended the two-week confab, held from 8:30 to 11 a.m. daily.

B. G. Reed, vice president-operations, made opening comments to the group, while Herbert Hinckley, B-58 program director, closed out the session and presented graduation diplomas.

Teams and projects were:

Magazine assembly: R. H. Geckler, 160; R. E. Walkington, 287; E. L. Falkner, 40; G. O. Davis, 22; and J. B. Wattier, 64.

Panel Assembly: B. W. Landborg, 160; F. J. Donahue AFPR; C. J. York, 4; D. H. Trout, 24; W. D. McClure, 107; W. M. Slifer, 65.

Guard Assembly: C. E. Martin, 160; G. P. Porter, AFPR; O. C. Cooper, 107; W. A. Wuest, 25; R. L. Hussey, 280; H. J. Durham, 61.

Pilots Glare Shield: B. B. Shuffler, 264; A. D. Garrison, 160; H. T. Hallmark, 23; K. M. Jackson, 11; E. A. Fish, 12.

Food Container: L. M. Smith, 263; J. G. Randolph, 160; T. J. Shockley, 35; J. B. McGaughy, 29; R. T. Teel, 189; O. M. Collier, 83.

Panel Assembly: C. A. Atkinson, 162; E. A. Olsovsky, 166; W. D. Collins, 4; D. R. Bryan, 180-2; W. F. Danner, 24.

Bolt Assembly: R. Wenger, 165; R. D. Smith, 165; A. J. Foster, 88; H. E. Scott, 24; R. E. Forrester, 28.

Pilots Blast Shield: R. Kendall, 160; T. J. Osborne, 262; M. E. Miller, 27; N. W. Barnhill, 24; R. L. Storey, AFPR; G. J. Romer, 3-3.

GD/FW Friends Give Blood for Boy, 12

GD/Fort Worth employees responded quickly with blood donations in response to recent open-heart surgery on Tommy Barrow, 12-year-old son of N. D. Barrow, Dept. 22.

Replacing blood for Tommy were: A. A. Zdzienkowski, 22-1; C. R. McDaniel and J. C. Williams, 22-2; K. L. Dollahite and C. M. Hudson, 22-3; B. L. McMillen, E. D. Brinkley, C. L. Harris, and R. L. Rice, 22-6; J. H. Braunt, J. M. Hudson and V. A. Newton, 22-7; O. B. Moberly, 24-4; J. D. DuPree, and F. W. Moore, 24-7; M. Joiner 260; and D. M. Altizer, 18.

Hourly employees are reimbursed by GD/FWRA for any time lost from work while donating.

In this case, blood was donated directly. Ordinarily, volunteers donate blood to replace that used at a particular hospital by an employee or member of his family.

GD/FW Engineer Sets Computer For Cystic Fibrosis Research

A General Dynamics/Fort Worth engineer and a giant IBM computer have helped speed up a Fort Worth doctor's research into causes of a deadly childhood disease.

T. L. Smith, project aerosystems engineer, spent nearly 30 hours of his own time setting up a computer program for data on transmission of cystic fibrosis of the pancreas. This is one of the major manifestations of mucoviscidosis, one of the most deadly diseases of children in the U. S.

The data was gathered by Dr. Edwin G. Troutman, director of medical education at Harris Hospital.

"Dr. Troutman has developed an improved sweat test that can be easily reproduced in other laboratories," Smith said. "Data obtained from this test has been used to study transmission patterns of cystic fibrosis."

(In nearly all cases of the disease, a high level of sodium and chloride is found in the patient's perspiration. One of several sweat tests is normally used in diagnosis of the disease.)

In Dr. Troutman's tests, weight and electrical conductivity of

samples, and code number of persons being tested, were recorded on a data sheet for key-punching onto an IBM card.

Test results from 150 people — including patients and their relatives, persons with "symptoms," and persons with no symptoms — were divided into 34 different groups.

Statistical cross-correlation of all factors in each group by the hand method would have taken an "interminable period," Dr. Troutman pointed out.

But the 7090 computer, which can make 230,000 additions or subtractions a second, can do a single analysis of all 34 groups in about two minutes!

The 7090 computer is operated by the information technology group of the systems technology department (062).

"The results produced by your machine probably saved a couple of years of research time," Dr. Troutman said.

"As a result of these statistical investigations, new ideas have been discovered concerning the possible transmission patterns of cystic fibrosis and some promising leads for future study of the problem have been established," Smith said.



RESEARCH AID—T. L. Smith, project systems engineer, came to aid of medical researcher by programing data on transmission of cystic fibrosis.

Air Force's Outstanding Unit Citation Goes to Clevenger

Capt. R. P. "Dick" Clevenger, an Air Force Education-With-Industry officer at GD/Fort Worth, has been authorized to wear Air Force's Outstanding Unit Award.

He was a member of the 10th Tactical Reconnaissance Wing, which earned the unit citation for outstanding service from Dec. 31, 1959 through Jan. 1, 1962. As such, he is entitled to wear the ribbon representing this award permanently.

Capt. Clevenger owns a BBA degree from University of Oklahoma, where he has done graduate work in economics.

Before joining the EWI program at GD/Fort Worth, he served for three years in Europe as aircraft commander on a reconnaissance crew with the 10th

Tactical Reconnaissance Wing.

He is a command pilot with 12 years of commissioned service.

Col. Max Boyer, Air Force Plant Representative, presented the award to Capt. Clevenger in a recent ceremony.

Dave Norton Elected To Material Office

Dave Norton, Dept. 8 industrial engineer who has been active in the division's material handling program since 1951, has been elected president of Fort Worth Chapter, American Material Handling Society.

Norton is also active in the Society of Automotive Engineers, having served on the organization's governing board for several years.



CEREMONY—Capt. R. P. Clevenger, right, receives Air Force Outstanding Unit award from Col. Max Boyer, AFPR.